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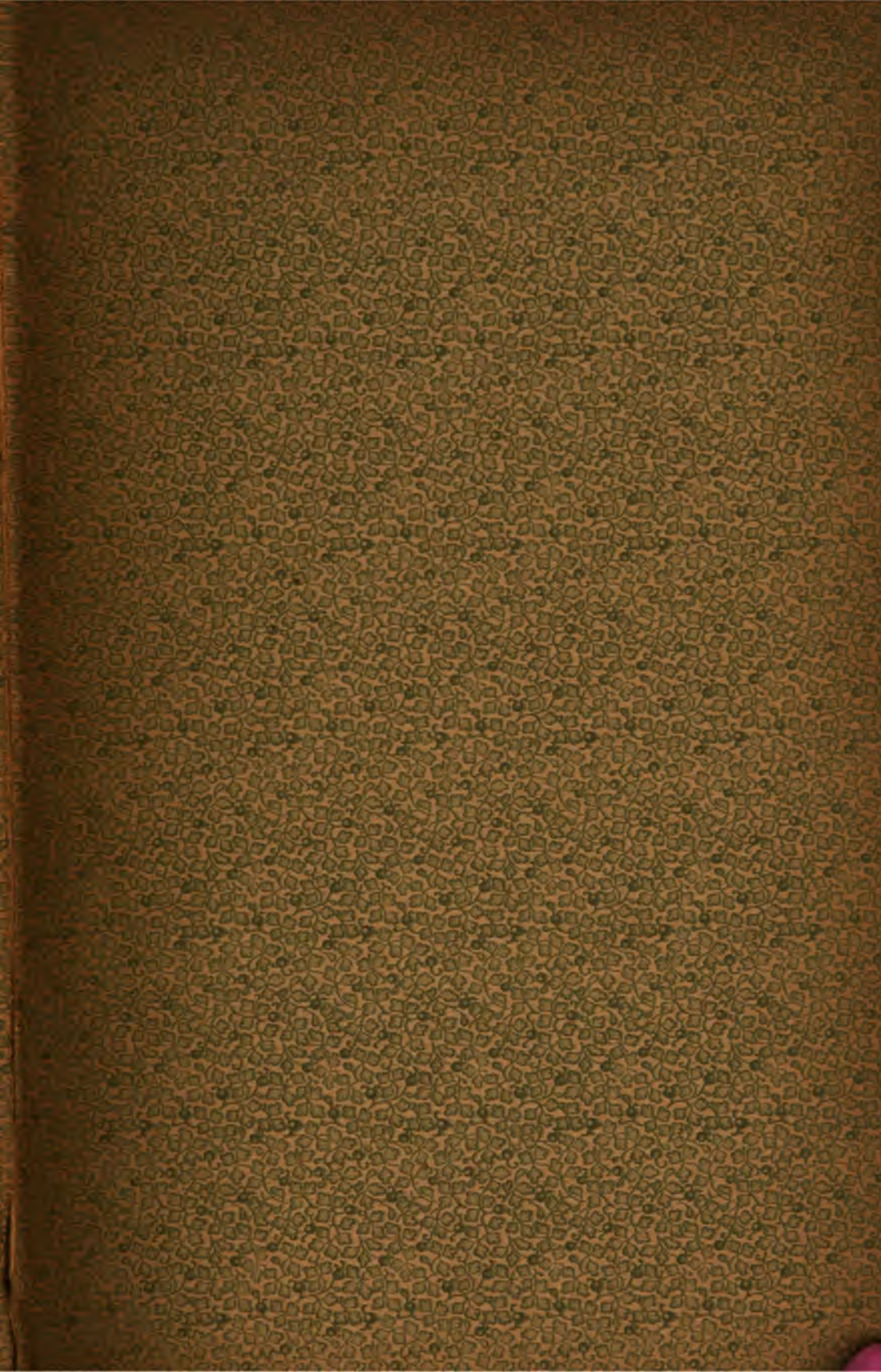
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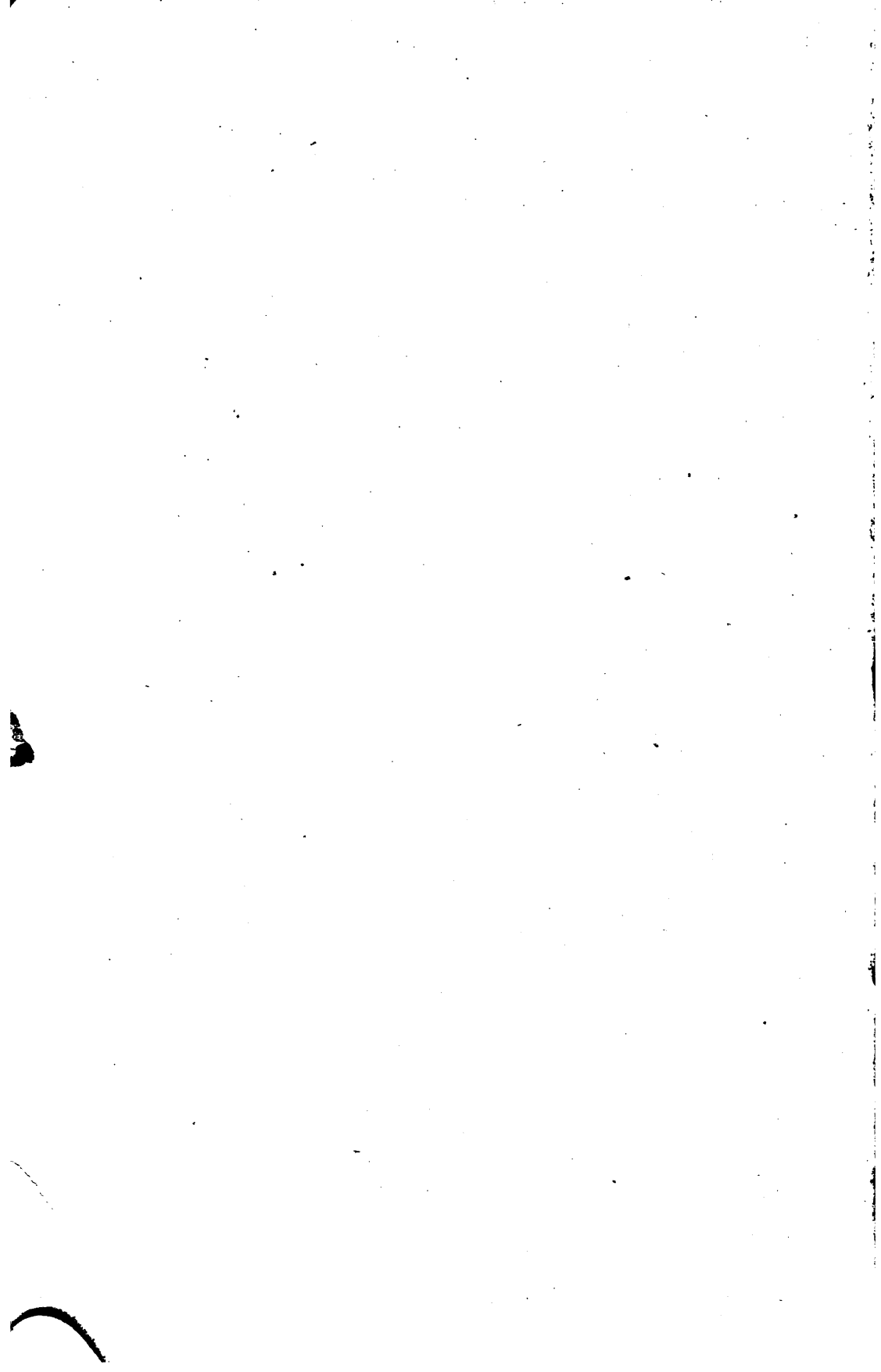
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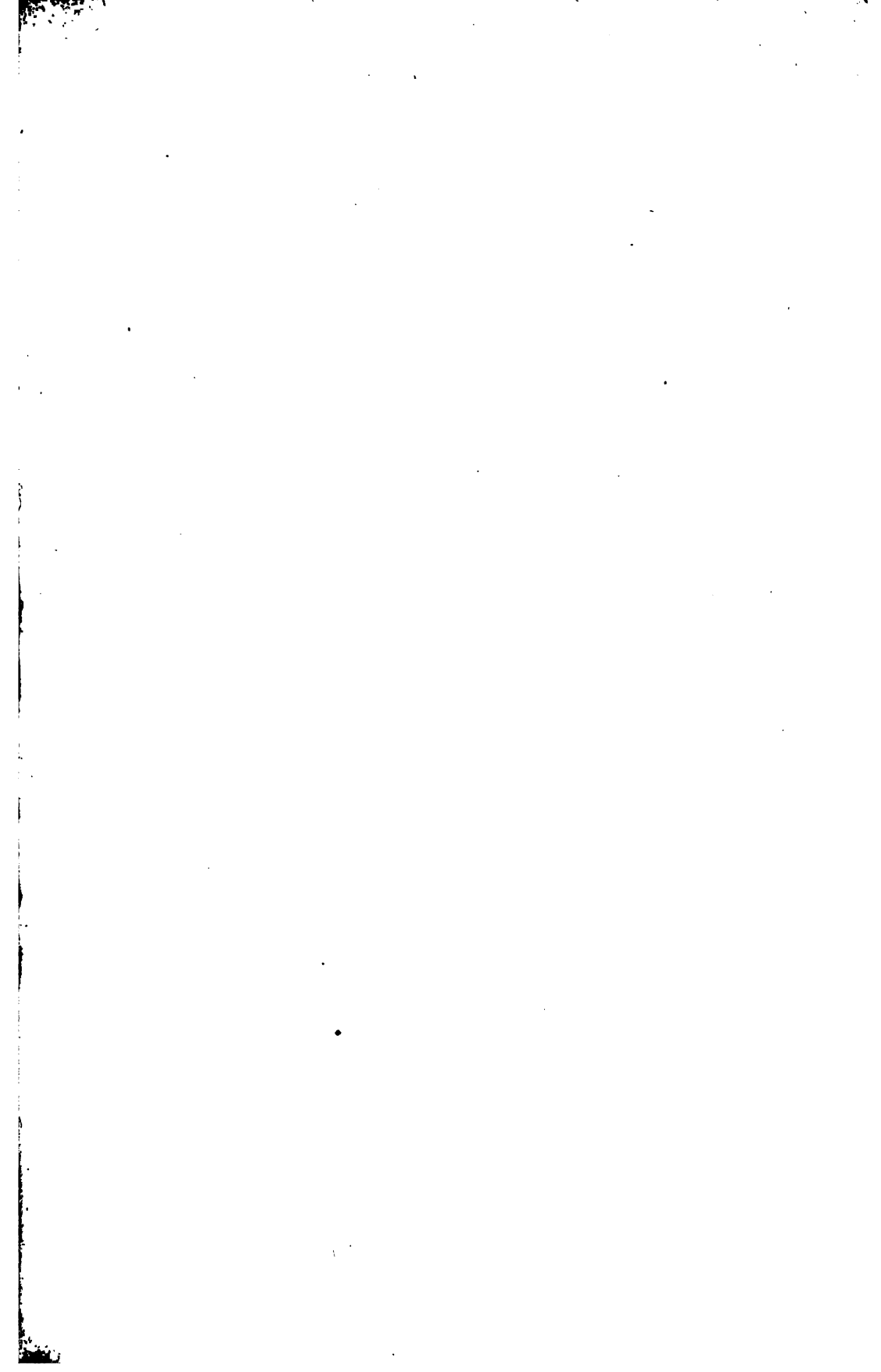
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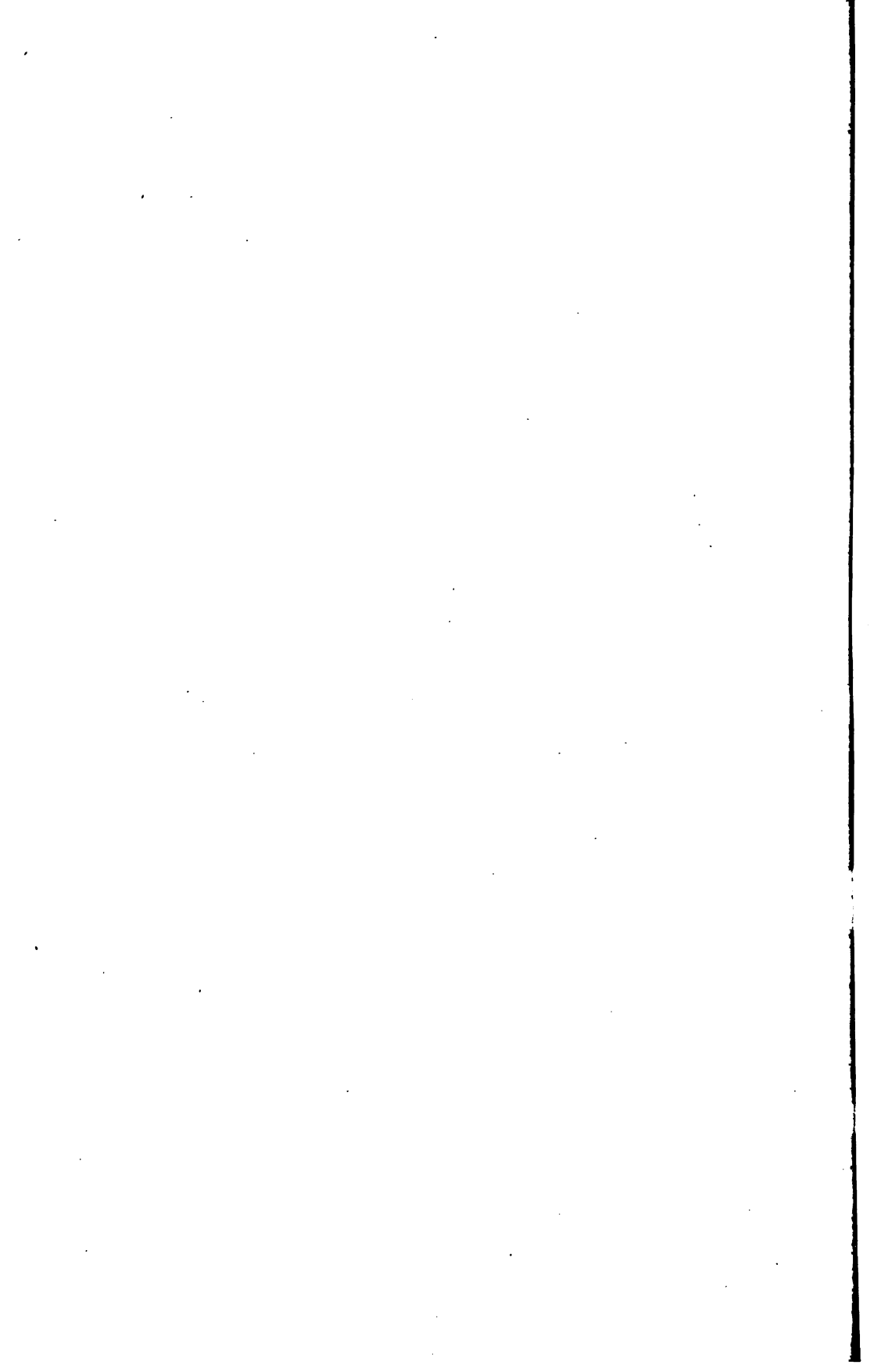












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OF THE

## UNITED STATES VETERINARY MEDICAL ASSOCIATION

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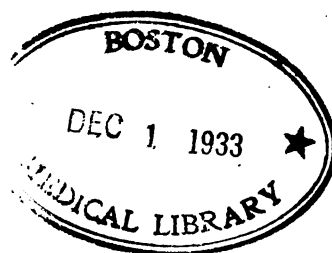
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 Saunders, Charles, Eldorado, Kan.  
 Saunders, R. J., Salem, Mass.  
 Sawyer, F. N., Galt, Cal.  
 Schaffter, E. P., Kansas City, Mo.  
 Scheibler, J. W., 310 3d St., Memphis, Tenn.  
 Schœnleber, F. S., Morris, Ill.  
 Schwartzkopf, Olof, Flushing, N. Y.  
 Shaw, Walter, 18 N. Ludlow St., Dayton, Ohio.  
 Shea, Joseph, Isaac St., Fordham, N. Y.  
 Sheldon, A. J., 50 Village St., Boston, Mass.  
 Shepard, E. H., 793 Doan St., Cleveland, Ohio.  
 Sherman, W. A., 214 Pawtucket St., Lowell, Mass.  
 Sherwood, T. G., 107 W. 37th St., New York, N. Y.  
 Siegmund, William C., 1918 Wilkins Ave., Baltimore, Md.  
 Sihler, C. J., 7th St. & Everett Ave., Kansas City, Kan.  
 Smith, D. E., Great Neck, L. I., N. Y.  
 Sollberger, R. J., 1412 S. 8th St., St. Louis, Mo.  
 Stalker, M., Ames Iowa.  
 Staples, S. B., Baton Rouge, La.  
 Steddom, R. P., Galesburg, Ill.  
 Stewart, S., 7½ S. James St., Kansas City, Kan.  
 Stickney, J. H., American Stables, 24 Chardon St., Boston, Mass.  
 Stinson, William, 51 Blossom St., Chelsea, Mass.  
 Strange, A., 322 W. 15th St., New York, N. Y.  
 Stranghan, W. P., Jewett Center, N. Y.  
 Stringer, N. I., Box 83, Eureka, Ill.  
 Sutterby, Harry, 20 W. Main St., Batavia, N. Y.
- Taylor, B. C., Hillsboro, N. Dak.  
 Thompson, J. K., 301 Union Ave., Pueblo, Col.  
 Thompson, S. H., Carberry, Manitoba, Canada.  
 Treacy, M. J., Fort Meade, S. Dak.  
 Trumbower, M. R., 508 Holland Building, St. Louis, Mo.  
 Turcot, Isadore, Langdon, N. Dak.

Turner, J. P., Fort Meyer, Va.

Turner, T. J., care of Kingan & Co., Indianapolis, Ind.

Very, T. S., 82 Pitt St., Boston, Mass.

Vogt, A. G., 119 Plane St., Newark, N. J.

Voorhees, E. R., Somerville, N. J.

Walker, R. G., 95 Aberdeen St., Chicago Ill.

Waller, H. N., East Liberty Stockyards, Pittsburg, Pa.

Walrath, J. A., 691 Quincy St., Brooklyn, N. Y.

Walrod, George M., Storm Lake, Iowa.

Water, E., 112 Ashland Place, Brooklyn, N. Y.

Wattles, J. H., 1111 Cherry St., Kansas City, Mo.

Waugh, J. A., 1331 Forbes St., Pittsburg, Pa.

Weber, S. E., Lancaster, Pa.

Webster, R. G., Salem, N. J.

Weicksel, H. J. S., 116 W. Chestnut St., Shamokin, Pa.

Wellner, Herman, 328 Granite St., Manchester, N. H.

Wende, B. P., Mill Grove, Erie Co., N. Y.

Wende, H. S., cor. Adams and Seymore Sts., Tonawanda, N. Y.

Wheeler, A. S., Biltmore, N. C.

Whitbeck, S. S., Decorah, Iowa.

White, D. S., 1594 Neil Ave., Columbus, Ohio.

White, T. E., Columbia, Mo.

Whitmore, N. P., Gardner, Ill.

Whitney, Harrison, 20 George St., New Haven, Conn.

Wicks, A. G., 429 Liberty St., Schenectady, N. Y.

Wight, W. E., Delaware, Ohio.

Williams, W. L., Ithaca, N. Y.

Williamson, F. P., Velasco, Texas.

Winchester, J. F., Lawrence, Mass.

Withers, R. J., 627 S. Main St., Los Angeles, Cal.

Wray, W. H., Beauchene, Fox Hills, Upper Norwood, London, Eng.

Wright, J. M., 1639 Wabash Ave., Chicago, Ill.

Youngberg, A., Lake Park, Minn.

Zucker, F. A., 256 Morris Ave., Elizabeth, N. J.

Zuill, W. L., 857 N. Broad St., Philadelphia, Pa.

## ELECTED TO ACTIVE MEMBERSHIP.

NASHVILLE, SEPTEMBER, 1897.

- 
- Ira K. Atherton, (V. S., N. Y. C. V. S., 1893,) Marshalltown, Iowa.  
Vouchers, W. L. Williams and S. Stewart.
- Geo. B. Blackman, (D. V. S., A. V. C., 1897,) Rome, Ga.  
Voucher, W. C. Rayen.
- A. W. Bitting, (D. V. M., I. A. C., 1895,) LaFayette, Ind.  
Vouchers, W. B. Niles and A. T. Peters.
- S. Hutson Caldwell, (M. D. V., McK. V. C., 1897,) Montgomery, Ala.  
Voucher, C. A. Cary.
- P. J. Cronon, (M. D. V., Harvard Univ., 1893,) 257 Northampton St.  
Boston, Mass.  
Vouchers, F. H. Osgood and W. L. LaBaw.
- R. H. Drummond, (M. D. C., C. V. C., 1891,) 1910 Fourth Ave., Birmingham, Ala.  
Voucher, C. A. Cary.
- Frank, T. Eiseman, (D. V. S., C. V. C., 1886,) 222 E. Main St., Louisville, Kentucky.  
Vouchers, J. W. Scheibler and J. B. Rayner.
- H. D. Fenimore, (D. V. S., A. V. C., 1891,) Knoxville, Tenn.  
Vouchers, E. B. Ackerman and Wm. Herbert Lowe.
- D. P. Frame, (M. D. C., C. V. C., 1894,) 11 So. Wasatch Ave., Colorado Springs, Colo.  
Voucher, A. T. Peters.
- M. Francis, (D. V. M., Ohio State Univ., 1887,) College Station, Texas.  
Voucher, W. H. Dalrymple.
- T. A. Geddes, (D. V. M., I. A. C., 1887,) Ames, Iowa.  
Vouchers, W. B. Niles and S. Stewart.
- A. Gibson, (V. S., Ont. V. C., 1896,) Birmingham, Ala.  
Voucher, C. A. Cary.
- Jos. M. Good, (V. S., Ont. V. C., 1894,) Chattanooga, Tenn.  
Vouchers, J. W. Scheibler and W. C. Rayen.
- Chas. W. Heitzman, (M. D. C., C. V. C., 1890,) 1410 Thalia St., New Orleans, La.  
Voucher, W. H. Dalrymple.
- John W. Jameson, (V. S., Ont. V. C., 1889,) 817 Pleasant St., Paris, Ky.  
Vouchers, J. W. Scheibler and F. T. Eiseman.
- David King, (V. S., Ont. V. C., 1887,) Natchez, Miss.  
Voucher, W. H. Dalrymple.
- George N. Kinnell, (M. R. C. V. S., 1885,) Pittsfield, Mass.  
Vouchers, F. H. Osgood and W. L. LaBaw.



J. R. Mitchell, (D. V. S., A. V. C., 1890,) Evansville, Ind.

Vouchers, W. C. Rayen and R. R. Bell.

J. C. Norton, (D. V. M., I. A. C., 1890,) Phoenix, Ariz.

Vouchers, M. Stalker and S. Stewart.

Maurice O'Connell, (D. V. S., A. V. C., 1886,) Holyoke, Mass.

Voucher, F. H. Osgood.

Jos. Plaskett, (D. V. S., McGill Univ., 1892,) 529 Broad St., Nashville, Tenn.

Voucher, W. C. Rayen.

Edw. M. Ranck, (V. M. D., Univ. of Pa., 1897,) 4021 Market St., Philadelphia, Pa.

Vouchers, W. Horace Hoskins and Leonard Pearson.

J. C. Robert, (V. M. D., Univ. of Pa., 1895,) Agricultural College, Miss.

Voucher, Leonard Pearson.

Geo. R. White, (D. V. S., Columbian Univ., 1897,) Chapel Hill, Tenn.

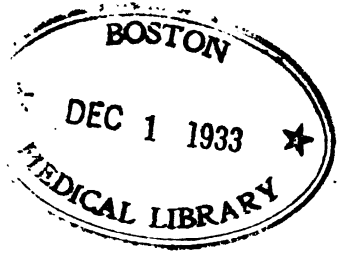
Voucher, W. C. Rayen.

HONORARY MEMBERS.

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- Arloing, Dr. Director Lyons Veterinary School, Lyons, France.  
Bang, Prof. Dr. Royal Veterinary College, Copenhagen, Denmark.  
Biggs, Prof. H. M. Bellevue Medical College, New York, N. Y.  
Burnham, Walter L. Lowell, Mass.  
Chauveau, Prof. A. Director-General of Veterinary Schools of France,  
Lyons, France.  
Dickerhoff, Prof. W. Rektor der Thierartzlichen, Hochschule, Berlin,  
Germany.  
Fleming, George. Higher Leigh, Combe Martin, North Devon, England.  
Johne, Herr Prof. Dr. J. Thierartzlichen Hochschule, Dresden, Germany.  
McFadyean, Prof. J. Great College St., Camden Town, London, England.  
McEachran, D. 6 Union Ave., Montreal, Canada.  
Michener, Isaiah. Carversville, Pa.  
Mills, Wesley. Westmount, Montreal, Canada.  
Moller, Herr Prof. H. Thierartzlichen Hochschule, Berlin, Germany.  
Nocard, Prof. E. Alfort Veterinary School, Alfort, France.  
Perroncito, Prof. Royal Veterinary College, Turin, Italy.  
Raymond, J. H., M. D. 173 Joralemon St., Brooklyn, N. Y.  
Roll, Prof. Dr. K. K. Militar Thierarznei Institute, Vienna.  
Smith, Theobald. Forest Hills, Boston, Mass.  
Stein, A., M. D. 28 W. 15th St., New York, N. Y.  
Thayer, J. L., M. D. West Newton, Mass.  
Thomassen, Prof. Dr. Reichsthierarzneischule, Utrecht, Holland.  
Weisse, F. D., M. D. 46 W. 20th St., New York, N. Y.  
Welch, Prof. William H. Johns Hopkins University, Baltimore, Md.  
Williams, Prof. William. New Veterinary College, Lethwalk, Edinburgh,  
Scotland.





MINUTES OF THE PROCEEDINGS  
OF THE  
**UNITED STATES VETERINARY MEDICAL ASSOCIATION**  
AT ITS THIRTY-FOURTH ANNUAL MEETING,  
HELD AT  
NASHVILLE, TENN., SEPT. 7-8-9, 1897.

FIRST DAY—*Tuesday, September 7.*

*Morning Session.*—The convention was called to order at 10 o'clock A. M. by President Osgood who introduced Dr. W. T. Hagyrd, who extended the following words of welcome to the society:

MR. PRESIDENT: I was requested this morning by the Mayor of Nashville to represent him in a few words of welcome. I want to say that I am agreeably surprised this morning. I didn't know there were so many Veterinary Surgeons in the world. I bid you welcome to this State and City whose fame has gone abroad, a city who stands amidst the galaxy of cities in this country as the Athens of the south, and which has been doubly renowned by the presence of our magnificent Centennial. Your presence this morning is an innovation in Nashville and of the conventions that have assembled in our city I consider that you stand next to those who minister to our human ailments and ills, and I do not know but it is a little more difficult task, and your skill a little more keen and far reaching, in

that we can locate our troubles or aid in doing so but the poor dumb brutes must depend entirely upon your own skill, and by relieving them you help humanity.

And so to-day I bid you welcome in the name of the Hon. Mayor of the City of Nashville and in the name of her citizenship, and in the name of our great Centennial, I bid you welcome, ladies and gentlemen.

Hon. John J. McCann was introduced by the President who in behalf of the Governor of Tennessee and the Centennial Exposition extended a hearty and humorous welcome which was highly appreciated by all present, eliciting hearty laughter and applause.

Dr. Pearson when called upon by the President to respond to the address of welcome spoke as follows:

I am sure I voice the sentiments of all of the members of the United States Veterinary Medical Association present at this time when I say that we fully appreciate and are deeply grateful for the generous welcome that has been extended to us. All of us have heard of, and many of us have experienced, the wonderful scope and rare quality of Southern hospitality; much has been said of Nashville, the city where the latchstring hangs outward and the doors swing inward. So, in coming here, our anticipations are high; we expect to have a good time, to make new and pleasant affiliations and to enjoy a profitable meeting.

Some of our expectations are already realized, and all bid fair to be. We are already delighted with your city, charmed by the Exposition and hypnotized by our welcome.

When it was suggested last year that we should come to Nashville for our next annual meeting there was some opposition on the alleged grounds that Nashville is too far south or too far west, too difficult to reach; that Nashville is too hot in September, and that Nashville is too far from the center of the work of the veterinary profession in the United States.

But all of these objections were overcome, and we find that Nashville is neither too far south nor too far west, but that it is situated in just the right spot, on a magnificent site

in the midst of a surpassing territory. Instead of being difficult of access, all roads seem to lead to Nashville, and I am sure that many of us will find it more difficult to go away than it was to come. As to the climate, it has been most pleasant ever since we have been here, and our members from points furthest north have escaped oppressive weather by taking this trip. I understand, however, that some one who returned from the Exposition rather late last night exclaimed that Nashville is a "hot town," but he probably had no reference to the temperature.

As to the remaining point that Nashville is too far from the center of veterinary work in this country, it is true that this is the case and this in part explains our presence here this week. The center of the live stock industry cannot be far from this State and the limits of veterinary work should coincide with those of the industry that it protects and fosters.

A State that depends on domestic animals to the extent that Tennessee does; a State of such great resources and prosperity and enterprise should command the best veterinary skill in the country. Just think, for a moment, how essential the live stock industry is here. If all domestic animals were exterminated what suffering would ensue. There would be no horses or mules to till the fields; no beef, mutton, pork, milk or eggs; no wool; no means of transportation, in many sections, and no manure with which to maintain the fertility of the farms. Under such conditions all business would stagnate and perish, the people would suffer for want of food and the land would become sterile.

The live stock interests are worthy all possible protection and improvement, and this is the function of the veterinary profession. The live stock of Tennessee is famous throughout the country and the world, the horses and cattle of this Commonwealth are famous everywhere and the proud distinction of having bred the fastest horse that ever wore harness belongs to this state. Notwithstanding the vast mineral, timber and manufacturing interests of Tennessee, agriculture surpasses them all, and the live stock

industry is the corner-stone of agriculture. For these reasons, veterinary science is of the highest importance to the continued prosperity of this Commonwealth, and it should be fostered and encouraged by its citizens, as individuals and as representatives of State and local government. The best men in the profession should be selected for public positions. It is only in this way that justice can be rendered to the taxpayers and the veterinarians encouraged to put forth their best efforts. To select imperfectly trained and incompetent men for strictly veterinary positions retards veterinary science and the full prosperity of the locality. Tennessee is fortunate in having within her borders a number of excellent men upon whom it can draw for their service.

And now, Mr. President, permit me to again thank the representatives of the people of Nashville for their cordial welcome and to say that we fully expect to have one of the best meetings in our history, and are glad we are here.

The President, Dr. F. H. Osgood, delivered the annual address as follows:

#### PRESIDENT'S ADDRESS.

GENTLEMEN: It is a time honored and, withal, a useful custom for those of us who are elected to preside over the deliberations and actions of important associations of men for the accomplishment of a specific purpose; or for shaping a policy that will result in doing "the greatest good to the greatest number," to deliver an inaugural address which consists mainly, in recalling the memories of those to whom the address is made to whatever the author considers to be the more important questions of the hour; giving his own opinion upon their merits and asking that the body corporate deliberately debate, arrive at some conclusion, and take such action upon them as seems best.

The procedure of this Association makes it impossible for an incoming president to give an inaugural address; as a matter of fact he is elected and conducted to the presiding chair so unexpectedly to himself, so quickly and amid so

much and so many hearty congratulations and loud acclamation that it is impossible for him—for any man to so thoroughly collect his wits as to be able then and there to outline a policy and recommend action for the coming year; which is, however, notwithstanding this fact, to be the year of his administration.

For myself I am sure that, as I look back upon that day, at our meeting in Buffalo last year, upon which you conferred upon me the honor of making me your presiding officer for the then coming year, I feel certain that I was not able to collect myself sufficiently to convey to you, at all adequately or truly, my sense of the honor and obligation.

It is proverbial how few there are of us who are able to make a good extemporaneous speech:—there are still fewer of us who are able, after suddenly being elected to the presidency of a scientific association of the character of our own, to take the chair and at once return his thanks to you for his election in terms as stately, in language as precise, or in substance as full as his dignity and yours demand. I should be very sorry to see the day arrive at which, under our present form of constitution, this condition of affairs does not obtain; for it would evidence to me, and to us all, and to those who take interest in our proceedings that the U. S. V. M. A. had come under the rule of a caucus; that the days of effective open discussion and, perhaps, the rule of a majority of our members had ceased to be: the very crudeness of the first address from a newly elected chair is, as matters now stand, our warrant of safety in this respect.

But what of the other objection which I have raised to our present method of electing officers for the ensuing year? Fortunately no harm has as yet arisen from it, but who can say how long it will be before some question will arise, upon which there is a decided difference of opinion and upon which the election of the presiding officer will itself depend? The election takes place; it is found that a majority of the members, present and voting, have elected a new president who is opposed to the policy advocated in the annual address of the retiring president. Must a year be lost before the new party



have opportunity to declare its policy, through its newly chosen mouth-piece, to the profession; and then, after that year of inaction has passed must the members of this Association be obliged to make up their minds within a day or two, and amid the many diversions of an annual meeting, how they will vote upon important matters? I believe that herein lies one of our dangers; and I suggest to you the desirability of considering such an alteration of the constitution and by-laws as will tend to overcome this difficulty.

In the same line there is, it seems to me, another evil; (as our law now stands) the officers for the ensuing year are elected by those members present and voting at our annual meeting, and by them alone.

This means that the right of franchise is not with us, as it should be, *free*; but that each member who desires to vote for the Association's officers must pay for that privilege the exact sum which it costs him to leave his business at an actually stipulated time, to travel to and from the place where the meeting is to be held, and support himself while absent.

This is a light charge to but very few of us, it amounts to a prohibition in many, perhaps a majority of instances. Would not our members take a more active interest in our proceedings if a safe method could be devised by which each and every one of them could vote in each election of officers; upon all questions of proposed change of constitution and by-laws; upon admissions to honorary memberships; and, perhaps, upon all other questions not directly arising from the business of the annual meeting. I am sure that our *Journals* would help us to distribute, among our members, the requisite knowledge of facts. I sincerely believe that our membership would be glad to avail itself of all the opportunities that might be offered under a possible general plan looking to this end.

In considering this matter further, it seems to me that we shall find that, as an association, we are in a peculiar and somewhat unusual situation.

Most societies of this kind—that is scientific associations

—are absolutely local, or at most cover no more than a single county or a single state; or if they are National in character, the general annual meeting is attended by delegates, who are elected by local societies and go to the general meeting with instructions as to voting, etc., from such societies, thus giving each and every member a chance to cast his vote freely, conveniently and without excessive or unusual cost to himself.

Were we not, at the time our constitution and by-laws were accepted in this part, by comparison, a local association with our meetings held either in New York or Boston? Now the meetings are held in the East, the North, the West and the South with, just now, a strong movement on foot to carry us to the Pacific Coast in the near future. We are, by comparison, a very wide spread association covering, or trying to cover, more ground, I imagine than any similarly constituted association in the world. It would be strange indeed if our older village laws were found to be adequate to the proper government of our present semi-continental proportions.

While as scientific associations go in this country, we have a fairly large membership, our roll is not what it should be in numbers, neither are our members uniformly as active as they should be.

There are, in this country, a great number of practicing veterinarians from whom this Association never hears; but among them there are many good men, doing special work, who should be, but are not, connected with us. We need all of these men and many of the others.

Why is it that we have never interested them? Why do they not need us? There is undoubtedly some good reason and I feel that it is our duty to endeavor to find it, and having found it to apply the remedy if that be possible, without hesitation. If this Association is not already the best medium as I think it is, for giving not only a national, but a foreign, publicity to the work of American Veterinarians, it should and will become more and more so as its membership increases; for, in the language of the second article of our

constitution the sole "purposes and objects of the Association are, to contribute to the diffusion of true science, and particularly the knowledge of veterinary medicine and surgery."

In its earlier days, the U. S. V. M. A., as has already been said, was essentially a local organization. The members, all personally well known to one another, met regularly twice a year, for one day; enjoyed the re-union, the papers, the discussions, the social opportunities and the good dinners with which the ceremonies were always concluded; and for all of this they paid very little for traveling expenses; they were away from home but for two nights and one day, at most; they paid a small annual due and, until the American Veterinary Review was begun under their auspices, they did little with the moneys thus collected. As times went on the membership increased, the members came to the meetings from greater and greater distances, until finally, and only within a comparatively short time, it was determined that the number of regular meetings should be reduced to one in each year, and that these meetings should be held at widely scattered points. This change was adopted solely because it was believed that in this way and in this way only would it be possible for us to increase our membership and become a National Association in anything more than name. This arrangement has now been on trial for a number of years and you should be able to ascertain whether it has resulted in the expected increase and retention of our list of members. Do we keep up the general interest as well as when we were smaller and met oftener? Do we need to hold more meetings that are within the comfortable reach of all? Can any method be devised under which such meetings can be held and the integrity of the National Association still be maintained? Is it possible or desirable for our present membership to maintain a Council whose duty it shall be to care for the executive business of the Association and to hold quarterly or semi-annual meetings in various parts of the Country?

With the growth of the Association there was a natural

growth in the amount of its routine business, which finally increased to such an extent as to very materially interfere with the general objects of the meetings. The papers often had to be hurriedly read; discussion upon them was shut off to a considerable extent; the opportunities for social intercourse theretofore belonging were lost because of this same press of business; and even the dinners had to be eaten at a late hour and in haste to catch the train.

The members ceased to find the pleasure and profit to which they had been used and interest in the meetings commenced to flag.

Hoping to do away with this evil the Association determined to extend the time of the annual meeting and instead of one day at two different periods in each year we now have one meeting of three consecutive days. And this year, because still of the disagreeable presence of this same question we are to consider the advisability of holding sectional meetings.

While this arrangement will undoubtedly facilitate the business of the few, will it not rather tend to decrease than increase general interest in the meetings. Will not members feel more than ever that they can get better ideas of the meeting by reading about it?

As one result of these changes, together with the considerable aid rendered by its zealous and energetic officers; and the hearty response of its members, the Association soon found that it was gathering together a great number of exceedingly valuable original papers upon all sorts of matters connected with veterinary and medical subjects—Comparative Medicine. Not only that, the papers when read at the meetings were then giving rise to free discussions of the various subjects, the value of which was oftentimes second only to that of the original paper giving as they did, a concise statement of the experiences and opinions of a number of men from different parts of the country.

While it was possible to have the various papers printed, and given wide circulation through the Journals, without cost to the Association, it was not possible in this way, to

print the discussions, nor was it possible to get the substance of the discussions, with desirable accuracy, without employing the services of a stenographer for the purpose. This condition of affairs was earnestly discussed at one of the annual meetings and the members then present voted that the Association should, at its own expense, obtain the necessary stenographic reports and cause them, together with the papers, to be printed and published as the "Proceedings" of the various annual meetings for gratuitous distribution among the members of the Association; to a certain number of the Scientific Societies at home and abroad; to the professional Journals everywhere; and to a careful selection of public or semi-public libraries.

A very little consideration of this new vote showed that the cost of carrying it out would be between \$600 and \$700 for each meeting; and that some method of raising a much larger amount of money than had theretofore been needed must be undertaken to meet this new direction of the Association. Again, after earnest consideration and discussion, in open meeting, it was voted by those present to raise the necessary amount of money by increasing the annual dues to \$5.

Further, this growth of the Association carried with it, as you will easily understand, a greatly increased amount of official work, which mainly fell upon the Secretary. That officer, at first serving without pecuniary remuneration, finally came to have a salary of \$100 per year, which it was found, after a while, "but not through disclosures made by the then incumbent of the office," did not begin to repay him for the cash actually expended in traveling expenses and incidentals incurred in carrying out the directions of the Association. With this knowledge the association raised this salary to \$200, which is less than it should be for the amount of work and personal expenditure demanded. Other necessary expenses amount now to from \$200 to \$250 each year.

So long, then, as the present scale of expenditure is maintained it will be necessary for us to raise from \$1,000 to

\$1,150 each year, to meet current expenses. Our only present source of income is by direct per capita tax upon our members, and those who may join us from time to time.

In a report which I have recently received our Secretary states that we now have 340 members of which 106 only have paid, during the past year, the rate of taxation being \$5 for each member, \$530—the uncollected tax for the year just closed amounting, at the time of the publication of the statement, to \$1,170; that is we have 234 members who have not, as yet, paid the annual dues for 1896. Further, of this 234 there are 100 members who have not paid their dues for two years, and whose names, therefore, under article 4 of chap. 8 of our by-laws, must be reported to-day to our Executive Committee, for suspension. Gentlemen! the condition is a serious and somewhat remarkable one:—we have of late years, been spending all of our energies and income, and the time, and resources of many of our individual members that we might, as I have shown, increase the members.

We now find that one of our rules and a good one, will if enforced by our Executive Committee, reduce our membership, at one blow, by one-third of its entire number. And more than one-half of our remaining members have accomplished half of the journey to the same end.

Why is it that we do not retain the hearty financial support of our members? Is it because our rate of taxation is maintained at a fixed point from year to year without regard to the financial condition of the times, or to the objects, for which a majority of the members may desire to spend money? Or is it because our present rate is too high?

There is no reason why the annual tax should not be assessed from year to year, if there is a clear understanding to begin with, that no member shall be called upon to pay more than a given amount—as \$3 or \$4 in any one year. An assessment may be voted at each annual meeting, which can be passed upon an estimate, previously made by the Secretary and submitted by him to each member, by mail.

This estimate can be added to or subtracted from by the

votes of the Association at the annual meeting and the actual rate fixed then and there. If times are hard and bills are paid, future expenses may be judiciously scaled, and the tax of all acceptably reduced.

With our present membership a yearly tax of \$3 each will give, if all members pay it, as they probably will, an income sufficiently large to meet all the requirements of the Secretary's estimate of expenses for the coming year.

If the Association has made a mistake in increasing the annual tax to \$5.00 let it now correct that error.

Those of us who were at the meeting in Buffalo last year, will readily call to mind the pleasure and profits that we had in welcoming and listening to members of our profession who attended that meeting from the Maritime Provinces, Canada, and the distant British Territory of Manitoba, and I think that I may safely say that, as we heard of the progress that our colleagues, from this last named territory especially, had made towards attaining to an almost ideal management of the great questions of public health which are now coming to veterinarians throughout the world for decision and action, that we almost envied them their progress and success.

Remembering this I am sure that you will be gratified to know that some of these gentlemen were, on their side, so much impressed with the goodness and soundness of the aims of our society, the earnestness with which we were endeavoring to accomplish the higher ends sought; and the great help that will come to us all from professional unity, that they have suggested to me and asked me to suggest to you, the desirability of changing the name of this Association to that of the National Veterinary Association of North America or, if not that exactly in name, that we should extend our constitution so as to include the veterinarians of the English Provinces of North America within our Union.

This suggestion coming from the source from which it does, merits, and I am sure will receive, your very careful consideration and action.

It is true that speaking, as we do, the same language, in-

termingling our lives as we do, throughout a long border line, *which is not fenced*; that many of our interests are, and will continue to be, in common. Many of our honored members, practicing in the United States are graduates of one or another of the Canadian schools, as there are also graduates of our schools practicing in Canada; and there is no doubt whatever that this condition of affairs will continue to exist. There has always been and will undoubtedly continue to be a free interchange of the domesticated animals between the two countries. In fact the professional and commercial union between certain parts of the United States and British North America, is now as close, as far as *our* mutual interests are concerned as it is between one and another of our States. But while there can be no doubt whatever that we are honored in welcoming these men to our active membership, and although I personally feel that we shall ourselves gain much in having the active co-operation of a large number of them, it seems to me that there are certain difficulties, under our present constitution and methods that will be intensified and serve but to still further embarrass us in managing our meetings and procedure in a way that will keep alive that hearty interest of our members which is so vital to the accomplishment of the higher ends to which we aspire. I leave the further debate of this question in your hands, knowing that it will receive from you the friendly and careful consideration which the proposition and its great importance deserves.

The Association has accomplished a great work in bringing about a more uniform and higher standard of veterinary education, which includes a graded course of study extending over three collegiate years of six months each guarded by a respectable admission examination, and in the organization of the "Association of Faculties" in whose hands the further consideration of this subject rests. We now have a new and equally important problem before us, which should be met, and met at once. It is within the knowledge of all, that Boards for the examination of Veterinarians who wish to practice within their jurisdiction, have been established



by several states; and that the outlook is that more such Boards will be instituted in the near future.

As matters now stand, each such Board is a law unto itself.

It should be the endeavor of the Association to pave the way to the institution of an examination that will be acceptable to all of the State Boards.

It is a matter for congratulation that so many of the States are of late, making appropriations of important sums of money for the purposes of making investigations regarding the diseases of domesticated animals; and that the work is being placed by the State Authorities, in the hands of Veterinarians.

The world's history shows that when work such as the stamping out of rinderpest, contagious pleuro-pneumonia and epizootic aptha from countries in which they had received a lodgment from abroad; and the limiting of the ravages of certain other contagions, as glanders in the European armies, has been entirely entrusted to the directions of Veterinarians, their efforts have been again and again crowned by success. The same history also shows, just as unfailingly, that when the work of veterinarians, in this respect, has been interfered with by laymen, whether they have been legislators, practitioners of human medicine or those who by rearing and pursuit in life, have become familiar with the habits, breeding and feeding of healthy animals, there has been a *non* accomplishment of the object sought.

In congratulating the several States upon their wisdom in making these large appropriations for special investigations; and ourselves that our profession is, through them, getting wider and wider substantial public recognition, we must not forget that, under the direction of the ably administered Bureau of Animal Industry, (U. S. Department of Agriculture) as well as many of the State Experiment Stations; there are veterinarians who work regularly and patiently year after year, upon kindred investigations; and who are unravelling, little by little, the many

knotty points and who are giving us, through their regularly issued Reports and Bulletins, information which is, in importance, secondary only to those great achievements of our science and art to which I have just called your attention, and to the ends which are sought by those who are managing the detail of the work now being carried forward under the special appropriations and in the glare of awakened public observation. Nor should we forget, in this self congratulation how much we owe to the legislative promoters who have made this great bureau and the State Experiment Stations possible; and to the wisdom of those patient authorities who have placed and maintained this work in our hands to do; and who have shown, by the action, that they have realized the great truth that the value of scientific investigation lies in the thoroughness, acuteness and deliberative action with which the work is done, rather than in the speed of *seeming* accomplishment; which too often proves to be no more than a mushroom growth and of similar stability.

There have been many new triumphs of mechanical ingenuity and engineering skill during the last few years, as well as in so many of the preceding ones of this remarkable century; none of which, perhaps are supposed to more closely affect veterinarians than those which have brought the bicycle into general use, and made possible the application of electricity as a motive power for our street railways. These inventions and their almost universal application to practice, have done away with the greater usefulness of an enormous number of horses of a certain class, and so far reduced the demand for them as to make their further production non-profitable; and, as the industry was, in a way, very wide-spread, so its sudden and nearly absolute destruction, has been so widely felt. Not only this, but as many of the large street railways changed from the horse power of former years to the new mechanical power, large numbers of these animals, fully acclimated, well trained to work and already at the very doors of what market remained for them, were suddenly offered for sale in numbers greater than

the demand, thus leaving the unmarketed animals of the sort in the hands of Northern and Western breeders.

In all of this, history has but repeated itself; and, just as all previous changes in demand have resulted in the final production of the stamp of horse called for, under the new conditions, just so surely will it be found that the ill effects of this change will be fully remedied, and that in a surprisingly short time. It is not the horse—*equus caballus*—that will be no longer required, but a certain and withal, a rather undesirable class of animals whose greater usefulness has passed or is passing.

While this change has been going on there has been an added and, I think, a more important factor at work in serving to depress our business. The generally felt great financial depression, which has existed for the past three years and the ill effects of which are still being felt, has so limited the volume of business and reduced profits as to not only lessen the number of men that can be advantageously employed, but also and markedly, the number of horses that can be used in business, or afforded for pleasure and convenience.

With this great falling off in remunerative work there has necessarily been a decrease in the earning capacity of all, with a consequent falling off. This has resulted in a lessened demand for produce and manufactures of all sorts; values generally, have fallen and with them the selling prices of all the domesticated animals have declined in proportion.

While all of these causes, then, have combined to temporarily reduce the incomes of many of us; it should not and must not lead to the acceptance of the proposition which has recently been advanced—namely—that bicycles and electric motors have destroyed the business of the Veterinarian. It should not be forgotten that while these changes in the mechanical arts have been going on, equally as great, if not even more remarkable discoveries have been made in our science; in our methods of accomplishing ends; and that if we keep ourselves abreast of the times—adopt the new motor, as it were, we shall have no more reason to complain

of dull times than will those who are engaged in other pursuits, in communities in which we are living.

Knowledge alone is not power, but the application of knowledge with a systematic intelligence, is a power, and is the power which wins the world's battles.

The association and communication with others who are constantly thinking and working upon the self-same problems with which we are ourselves engaged, develops all aspects, enlarges our scope of mental vision, and gives to us the knowledge with *power* to systematize and apply it as nothing else can, and to this end I extend to you all, a most hearty welcome.

#### ROLL CALL.

On motion the calling of the roll was dispensed with and the names of the persons present ascertained by circulating a paper for that purpose.

The following members were present: Drs. Ackerman, A. H. Baker, R. R. Bell, Bird, T. S. Butler, Cary, Clement, Connaway, Cotton, Dalrymple, Chas. Ellis, Gill, Greeson, Hinebauch, Hinkley, Hoskins, Kelly, Law, W. H. Lowe, McKillip, J. C. Meyer, Jr., Nelson, Osgood, E. P. Niles, W. B. Niles, Parker, Pearson, A. T. Peters, Rayen, J. B. Rayner, T. B. Rayner, Salmon, Scheibler, Shoenleber, Shepard, Stalker, Stewart, Wheeler, White, Williams, Winchester.

New members present: A. W. Bitting, Geo. B. Blackman, S. H. Caldwell, R. H. Drummond, F. T. Eiseman, H. D. Fenimore, M. Francis, T. A. Geddes, J. M. Good, C. W. Heitzman, J. W. Jameson, J. R. Mitchel, M. O'Connell, Jos. Plaskett, E. M. Ranck, J. C. Robert, G. R. White.

Delegates present: *Pennsylvania State Veterinary Medical Association*: Drs. J. C. Foelker and N. Rechtenwald.

Other members of the profession present: Tennessee—Drs. G. D. Bray, Columbia; R. E. Collins, Memphis; T. H. Haggard, Nashville; S. E. Jago, Shelbyville; J. P. Rauch, Memphis; T. W. Scott, Nashville. Ohio—Dr. R. J. Michener, Lebanon. Indiana—Dr. T. B. Pote, Terre Haute. Virginia—Drs. J. C. Blanton, Farmville; Dr. F. S. Roop, Blacksburg. Dis-

trict of Columbia—Dr. C. Barnwell Robinson, Washington. Canada—Dr. D. K. Smith, Toronto.

Ladies present: Mrs. A. H. Baker, R. R. Bell, J. W. Connoway, T. Bent Cotton, M. Francis, H. D. Fenimore, H. D. Gill, T. H. Hagyard, Jno. R. Hart, N. P. Hinkley, W. Horace Hoskins, M. H. McKillip, F. H. Osgood, Rapin, W. C. Rayen, C. B. Robinson, E. H. Shepard, F. S. Schoenleber. Misses Breast, Hogan, Mckillip, Miller, Willes, McDonnand, Rechtenwald, Watson.

Other visitors present: F. Abele, Jr., Quincy, Mass.; J. E. Aldrich, Memphis; Gen. Browning, Boston; B. F. Cockrill, M. D., Nashville; N. P. Hinkley, Jr., Buffalo; L. E. Morgan, M. D., Baton Rouge; J. D. Plunkett, M. D., Nashville; Ferdinand Smith, Chicago; H. Sorby, Chicago.

#### REPORT OF EXECUTIVE COMMITTEE.

The Executive Committee made the following report:

TULANE HOTEL, NASHVILLE, TENN., 4 P. M., SEPT. 6, 1897.

The meeting was called to order by Chairman Hoskins.

Members present: Drs. Bell, Cary, Hinkley, Hoskins, Osgood, Pearson, Stalker, Stewart, Williams.

Members absent: Drs. Howard, Robertson, Salmon, Trumbower.

Drs. Gill and Rayen were appointed to fill vacancies.

Dr. J. B. Rayner laid before the Committee an article appearing in the American Veterinary Review for August, 1897, written by Dr. Jas. Law, in which a quotation was introduced, associating Dr. Rayner's name with the alleged illegal sale of veterinary diplomas, requesting that the matter be investigated.

On motion the matter was referred to a committee of three, with instructions to report to the Executive Committee in 1898, and with discretion to report earlier through the veterinary journals. The Chairman appointed on this committee Drs. Bell, Williams and Pearson.

The following applications for membership were read and favorably recommended:

Ira K. Atherton, V. S., Marshalltown, Ia.  
George B. Blackman, D. V. S., Rome, Ga.  
S. Hutson Caldwell, M. D. V., Montgomery, Ala.  
P. J. Cronon, M. D. V., Boston, Mass.  
R. H. Drummond, M. D. C., Birmingham, Ala.  
M. Francis, D. V. M., College Station, Texas.  
Joseph M. Good, B. Sc., V. S., Chattanooga, Tenn.  
Charles W. Heitzman, M. D. C., New Orleans, La.  
David King, V. S., Natchez, Miss.  
George N. Kinnell, M. R. C. V. S., Pittsfield, Mass.  
J. C. Norton, D. V. M., Phoenix, Ariz.  
Joseph Plaskett, D. V. S., Nashville, Tenn.  
Edw. M. Ranck, V. M. D., Philadelphia, Pa.  
J. C. Robert, V. M. D., Agricultural College, Miss.  
George R. White, D. V. S., Chapel Hill, Tenn.

The application of D. P. Frame, M. D. C., Colorado Springs, Colo., was next considered, and it was found that while the candidate had matriculated in a two year school after January 1st, 1893, which would nominally bar him, he had completed work prior to this time which entitled him to the one year allowance granted by the college graduating him, and his application is consequently favorably recommended.

The resignation of S. K. Johnson, held over from 1896 on account of charges pending against him, was taken up. The Chairman announced that Dr. Johnson had been dismissed from the New York County Veterinary Medical Association owing to a violation of its Code of Ethics, which is equivalent to our Code. On motion, the Secretary was instructed to notify Dr. Johnson of the charges against him and cite him to appear and answer thereto at the meeting in 1898.

On motion the acceptance of the resignation of Dr. Herbert Neher was recommended.

The resignation of Dr. R. R. Dinwiddie was presented, and on motion of Dr. Pearson, the Secretary was instructed to express the regrets of the Association that his resignation had been tendered, and to hope that he might reconsider his determination and withdraw the same.

The resignations of Drs. L. H. Hempleman, H. J. McClellan, G. T. Netherton and M. A. Piche were presented by the Secretary, with the statement that they were each in arrears for dues, and upon motion, the Secretary was instructed to notify each that his resignation could not be accepted until the dues are paid.

On motion it was recommended that the resignation of Dr. Henry F. Leonard be accepted, to take effect September, 1895.

The resignation of Dr. Theobald Smith, Professor of Comparative Pathology in Harvard University, and Bacteriologist to the Massachusetts State Board of Health, was presented, and on motion it was recommended that his resignation as an active member be accepted, and that he be elected to honorary membership.

The charges of violation of the Code of Ethics preferred against Dr. John Faust in 1896, and referred to Dr. T. B. Rayner for investigation, were now taken up. The defense claimed that the actions complained of occurred twenty years ago. On motion, it was recommended that the charges be dismissed.

Charges were filed against Dr. G. E. Griffin for violation of the Code of Ethics by advertising proprietary remedies, and upon motion, the Secretary was directed to notify Dr. Griffin of the charges, and to cite him to appear before the Executive Committee meeting in 1898, and show cause why he should not be expelled.

The Secretary was directed to take similar action in the case of charges preferred against Dr. Junius H. Wattles, for violation of the Code of Ethics.

On motion a committee of three was appointed to confer with the Association of Veterinary Faculties of North America and the Association of Experiment Station Veterinarians, regarding the advisability of these two organizations becoming affiliated with the United States Veterinary Medical Association. The Chair appointed Drs. Williams, Pearson and Stalker as this Committee.

It was moved to divide Wednesday's meeting into two sections, one on State Medicine, the other on General Practice. On motion, the question was postponed until the meeting of the Committee on the morning of the 7th.

S. STEWART,  
Secretary.

TULANE HOTEL, NASHVILLE, TENN., 9 A. M. SEPT. 7, 1897.

The adjourned meeting of the Executive Committee was called to order by Chairman Hoskins.

Members present: Drs. Bell, Cary, Hinkley, Hoskins, Osgood, Pearson, Rayen, Stalker, Stewart and Williams.

Absent: Drs. Howard, Robertson, Salmon, Trumbower.

Applications for membership by A. W. Bitting, D. V. M., Lafayette, Ind.; F. T. Eiseman, M. D., D. V. S., Louisville, Ky.; and J. R. Mitchell, D. V. S., Evansville, Ind., were presented, and upon motion, favorably recommended.

The committee appointed to confer with the Association of Veterinary Faculties and the Experiment Station Veterinary Association as to the desirability of affiliation reported that it did not seem feasible to affiliate with these organizations.

Moved by Dr. Williams to recommend that the Association of Veterinary Faculties be offered thirty pages and the Association of Experiment Station Veterinarians fifty pages in the proceedings of the U. S. V. M. A., the same to be edited and furnished typewritten within ten days after the close of the annual meeting. Carried.

The motion to divide into sections was taken up for consideration, and lost.

It was then moved and carried to recommend that the subjects relating to State Medicine be advanced on the programme, and be considered at an evening session on Tuesday.

Adjourned to meet at 9 A. M., September 8, 1897.

S. STEWART,  
Secretary.

On motion the rules were suspended and the Secretary instructed to cast the ballot of the Association for the applicants for membership and they were declared elected.

The several recommendations of the Executive Committee were separately approved and the report adopted as a whole.

#### REPORT OF FINANCE COMMITTEE.

Dr. Hoskins, Chairman of the Finance Committee, reported as follows:



The report of the Finance Committee is rather an extended affair because it has been deemed wise to go back over the finances for the past four years. Frequent interchange of officers has resulted in difficulty to keep entire track of our resources, therefore, we have gone back to the report of the Treasurer in 1893 and find that we had on hand \$875.73.

We have also examined the Secretary's account of the receipts and expenses during the past year and found them correct.

RECEIPTS AND EXPENDITURES FOR THE UNITED STATES VETERINARY MEDICAL ASSOCIATION, 1893 to 1897.

ACCOUNT OF T. J. TURNER, SECRETARY, OCT., 1893, to SEPT., 1894.

Received in dues and fees.....\$ 575.70

EXPENDED.

Postage.....	\$ 31.25	
Printing and stationery.....	72.90	
Engrossing certificates.....	19.00	
Paid account of Charter Committee.....	49.25	
Railway special agent.....	17.00	
Draft to J. L. Robertson, Treasurer.....	175.65	
Exchange.....	.20	
Draft to W. Horace Hoskins for W. J. Dornan.....	125.00	490.25
		85.45
Turned over to Leonard Pearson, Secretary.....		85.45

ACCOUNT OF LEONARD PEARSON, SECRETARY, 1894-1895.

Amount turned over by Secretary Turner.....	\$ 85.45
Additional receipts, Philadelphia meeting.....	163.20
Receipts from members to Sept., 1895.....	755.10
	<hr/> 1,003.75

EXPENDED.

Telegram to B. D. Caldwell, Chairman W. P. A., Chicago, Sept., 10th, '95.....	\$ .85
Blank book and paper, Sept. 11, '95.....	.40
Postage, Sept. 10, '95.....	43.58
Expressage, Sept. 10, '95.....	2.95
Telegrams, Sept. 10, '95.....	3.26
Ptg. letter circulars, May 6, '95.....	1.50
200 notices, Oct. 26, '94.....	1.85
Reporting three day's proceedings of Annual Convention, Aug. 18, 19, 20, '94.....	150.00
W. J. Dornan, Aug. 1, '95.....	260.00
Repairing seal, Sept. 5, '95.....	1.50

Reporting and transcribing proceedings of Congress of Veterinary Colleges of North American, 127 pages, July 18, '94.....	\$ 63.50	
Stationery, Dec. 8, '94.....	10.25	
Banquet appropriation, Sept. 20, '94.....	40.00	
600 programmes, 12 pages, Aug. 31, '95.....	15.00	
Engraving 20 certificates and filling out dates, Aug. 6, '95.....	5.00	
Philadelphia Printing & Publishing Co., 500 application blanks, Aug. 7, '95.....	4.00	
500 envelopes, Aug. 8, '95.....	1.75	
150 extracts, Aug. 12, '95.....	1.50	
500 circular notices, Aug. 12, '95.....	2.00	
Copies of typewritten letter, June 2, '95.....	2.50	
Circulars, Oct. 15, '94.....	1.50	
Annual banquet, (local arrangements,) Sept. 12, '95...	15.00	
Attendance 32nd annual meeting as stenographer, six sessions, at \$5.00 per session, Sept. 12, '95.....	30.00	
W. J. Dornan, July 1, '95.....	136.73	
Dr. F. H. P. Edwards, Amount of account received.....	4.50	
Postage, for 1895, as State Secretary—57 letters 50 postals, Sept. 16, '95.....	1.64	
Postage on papers and reports to W. L. Williams, Oct. 26, '95.....	.65	
Expressage on certificates of membership, Oct. 26, '95	2.25	
Secretary's salary.....	200.00	1,003.66
Balance in Secretary Pearson's hands.....		.09

ACCOUNT OF S. STEWART, SECRETARY, SEPT., 1895, to AUG. 31, 1896, AND  
SEPT. 1, 1896, to SEPT. 6, 1897.

Received in dues and fees, 1895-96.....\$1,165.45

EXPENDED.

Postage.....	\$ 47.13	
Printing and stationery.....	70.50	
Express .....	10.80	
Extending stenographer's notes of meeting, 1895.....	55.00	
E. B. Ackerman on bill allowed 1894.....	19.60	
Wm. Dougherty on bill allowed 1894.....	6.00	
T. J. Turner, salary as secretary, 1893-4.....	200.00	
Special railway agent at Buffalo.....	17.00	
Miscellaneous accounts.....	15.90	
S. Stewart, salary as secretary 1895-6.....	200.00	641.93
Balance on hand Aug. 31, 1896.....		\$523.52

## MINUTES OF THE ANNUAL MEETING,

Received from various sources Sept. 1, '96. to Sept.

6, '97.....\$1,253.74

Expended (see Secretary's report)..... 945.04

Balance.....	308.70	308.70
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Amount in hands of Secretary Stewart Sept. 6, 1897.....	832.22
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## ACCOUNT OF W. HORACE HOSKINS, 1893 TO 1897.

Cash on hand on opening of meeting, 1893.....	\$108.33
Receipts from Chicago meeting.....	332.30
Cash returned by Dr. J. P. Turner, bal. Army Leg. Com. fund. '96-7	4.50
Cash for cloth binding of proceedings.....	.50
Cash for 1 copy of proceedings to A. C. McClurg & Co., 1896.....	2.25
	<hr/>
	447.88

To expense of President as per statement rendered.....	\$203.77
To expense of President as per statement Sept., '94, to	
Sept., '95 .....	15.23
To amount paid W. J. Dornan, Sept. 13, 1894.....	75.00
To expense of Committee on College Faculties as per	
statement .....	59.05
To expense of President as per statement Sept., '95, to	
Sept., '96.....	28.91
To refund to Mrs. J. R. Hart, funds advanced for	
Army Leg. Com. 1896-7.....	39.00
To President's order for flowers, funeral Dr. John R.	
Hart.....	5.00
To expenses for Publication Committee as per state-	
ment 1897.....	1.87
	<hr/>
	427.83
Balance in hands of ex-Secretary Hoskins.....	20.05

## JAM. L. ROBERTSON, TREASURER, IN ACCOUNT WITH THE UNITED STATES VETERINARY MEDICAL ASSOCIATION.

Amount in the treasury, October, 1893.....	\$875.73
Less error in account, 1893.....	\$ 10.25
Less amount remaining in Secretary's hands, 1893	108.33
	<hr/>
	118.58
Total amount in treasury, October, 1893.....	757.15
Dec. 14, 1893, to Wm. J. Dornan, printer.....	497.72
May 7, 1894, to A. H. Baker, for stenographer.....	250.00
	<hr/>
	9.43
To amount received from T. J. Turner, Secretary.....	175.65
Amount received from dues.....	15.00
	<hr/>
	200.08
Sept. 13, 1894, to Wm. J. Dornan, printer.....	\$200.00
	<hr/>
	200.00
Balance in bank.....	.08

## ASSOCIATION FUNDS, SEPT. 6, 1897.

In the hands of Treasurer Robinson.....	\$ .08
In the hands of Secretary Hoskins.....	20.05
In the hands of Secretary Pearson .....	.09
In the hands of Secretary Stewart.....	832.22
Total.....	<u>\$852.44</u>

On motion the report was accepted.

## SECRETARY'S REPORT.

The Secretary presented the following report:

During the year culminating in this meeting, the duties of the Secretary have been continuous and at times arduous. Immediately following the Buffalo meeting came the preparation of the Secretary's notes for publication, then personal letters to persons affected by the action of the Association during the meeting, including notices of election to membership; acceptance of resignations; suspensions from membership; preparation and delivery of certificates of membership. Also the issuance of a circular letter and blank form to all members to ascertain who desired cloth bound copies of the report of the proceedings.

Through the kindness of Dr. Hoskins the reports were mailed to the members directly from the house of publication. Those sent to honorary members abroad, were sent under the frank of the Smithsonian Institute. Acknowledgment of receipt of them has been received from two. Professor Moller, Berlin, and Professor Roll, Vienna.

The problem presents as to where the Association will store its records and papers, also the copies of reports not needed for immediate distribution. Through correspondence with President Osgood, Chairman Hoskins of the Executive Committee, and Chairman Williams of the Publication Committee, there has been secured from Principal James Law of Cornell University, an offer of sufficient space in a fireproof vault under his control for the storage of the papers and reports if the Association secures an acceptable custodian, who shall become responsible for the property. This

correspondence leads me to believe that Prof. W. L. Williams will accept the trust as custodian if the Association so desires, and that his appointment to this office will be acceptable to Principal Law, and Cornell University cannot be doubted.

In May and again on Aug. 10th statements of amounts due the Association were sent to the members with a circular letter calling their attention to the provisions of the By-laws making the dues payable in advance and to those members owing two or more years' dues a special clause was included in the circular letter sent them, calling attention to article IV, Chap. VIII of the By-laws which provides for the suspension of members who are in arrears more than eighteen months; yet very few members so in arrears have paid the same or in any manner acknowledged the receipt of such statements and circular letters, thereby indicating their willingness to be suspended. This apathy is probably due to the very great depression in veterinary practice, with consequent meagre revenues, and to a general feeling which prevails among members, that the annual dues are altogether too high and out of proportion to the benefits accruing to members who rarely find it convenient to attend the meetings. Many letters have been received containing this complaint.

I am pleased to make the following statement of the receipts and expenditures for the past year, also an account of the resources and liabilities upon the opening of this meeting:

RECEIVED FROM SEPT. 1, 1896 TO SEPT. 6, 1897.

Cash on hand Sept. 1, 1896.....	\$523.52
Dues collected for period ending Sept. 6, 1897.....	887.45
Collected from suspended members.....	41.60
Dues collected in advance for the year beginning Sept. 7, 1897.....	201.06
Initiation fees deposited.....	75.00
Sale of Reports of Proceedings.....	10.00
From Dr. W. Horace Hoskins on acct.....	38.63
Total.....	<u>\$1,777.26</u>

# HELD AT NASHVILLE, TENN., SEPTEMBER, 1897. 27

## DISBURSEMENTS FROM SEPT. 1, 1896, TO SEPT. 6, 1897.

Postage.....	\$ 39.66	
Printing.....	60.70	
Stenographer, Buffalo Meeting.....	68.25	
Printing and mailing Reports of Proceedings.....	408.95	
J. R. Hart estate, on bill for 1895-96, allowed.....	8.00	
W. L. Williams on bill for 1895-96, allowed.....	6.75	
Leonard Pearson, money advanced to Army Legisla- tion Committee for 1895-96.....	25.00	
T. J. Turner on bill for 1896-97, allowed.....	6.06	
Army Legislation Committee on bill for 1896-97, al- lowed.....	26.50	
J. P. Turner, not accounted for by vouchers filed.....	8.00	
Local Committee of Arrangements, 1895-96.....	50.00	
Resolutions, sent Local Com. of Arrangements, includ- ing engrossing, frame and express.....	14.65	
Engrossing certificate.....	6.25	
Miscellaneous.....	16.27	
Secretary's salary for 1896-97.....	200.00	945.04
Balance.....		\$832.22

## STANDING OF THE MEMBERSHIP RELATIVE TO ACCOUNTS FOR DUES.

40 members have paid dues in advance for 1897-98.....	
100 members have paid dues in full to Sept. 6, 1897.....	
102 members owe less than two years' dues, amount.....	\$635.55
58 members owe just two years' dues, amount.....	580.00
34 members owe more than two years' dues, amount.....	819.65
6 members partly qualified, owe.....	98.00
16 members who failed to qualify, owe.....	263.40

## RESOURCES.

Cash on hand.....	\$ 832.22
Dues which will probably be paid by members owing dues for two years or less.....	1,215.55
Dues for 1897-98 from 260 members who have not paid in ad- vance.....	1,500.00
Dues from members elect, estimated at.....	100.00
Total.....	\$3,647.77
Amount due the Association from members owing more than two years' dues and not included.....	\$1,181.05

## ESTIMATED EXPENSES FOR 1897-98.

Local committee.....	\$ 50.00
Unpaid bills.....	10.00
Stenographer.....	125.00
Reports.....	350.00
Printing and postage.....	100.00
Committees.....	100.00
Secretary's salary.....	200.00
Miscellaneous.....	25.00
Total.....	\$960.00

I am persuaded from the forgoing statements that the Association is in a position to safely reduce the annual dues to \$3.00 and believe this sum will yield ample funds to maintain the business of this Association. By making this reduction, a considerable number subject to suspension for delinquency will probably be inclined to pay the amounts now due, and retain their membership. This subject certainly merits your earnest consideration.

Official notices of appointment were sent the members of all committees, also Resident State Secretaries, as soon as I was apprised of their selection, and every effort has been put forth to maintain the interest of the members in the 34th annual meeting.

The officers and members, also the "Journal" and "Review" have given hearty support and the hope is entertained that this labor has tended to strengthen the Association and promote the purposes for which it is maintained.

Respectfully submitted,

S. STEWART,

Secretary.

On motion the report was accepted.

#### REPORT OF PUBLICATION COMMITTEE.

The Publication Committee, Dr. W. L. Williams, Chairman, reported as follows:

The Publication Committee of this Association has completed the tenth year of its existence, having had its origin in a motion by Doctor Hoskins, on March 15, 1887, instructing President Liautard to appoint a committee to publish and distribute the reports, papers and transactions of the Association.

We have found no report of this committee until at Chicago in September, 1890, Doctor Hoskins announced having secured, presumably from Review or Journal, reprints of transactions, and distributed the same among the members. The report apparently consisted of six pages, the expense of which we have not learned. (A. V. R. XIV, 415.)

At Chicago in 1890, a stenographer was employed for the

first time, the expense being borne jointly by Association, Review and Journal, both periodicals publishing the complete transactions, the Review having published them entire in one number, thirty days after the meeting. The Review report occupied 120 pages, of which 350 paper-bound copies were donated to the association. (Proc. U. S. V. M. A., 1891-92, pp. 60, 170.)

At the twenty-ninth annual meeting in Boston, Doctor Hoskins reported as chairman, that his committee had failed to publish a report owing to having been clothed with insufficient power, which he then asked should be extended, and on motion of Doctor Williams, he was instructed to have printed and distributed 500 copies of the transactions of the 1891 and 1892 meetings.

None of the papers or reports of 1891 meeting had appeared in the Review, though many of them had been printed in the Journal, and 250 extra copies of October and November numbers of the Journal were purchased by the chairman of the committee, which were by him distributed to non-subscribers of the Journal. (Proc. U. S. V. M. A., 1891-92, pp. 244, 386.)

At this date there was in the treasury a balance of \$750.00 which was ample to meet the required expenses of publication.

This report of 1891-92 consisted of 417 pages at a net expense of \$701.56, or \$1.68 per printed page for 500 copies (Proc. U. S. V. M. A., 1893, p. 369,) and appeared early in June, 1893, or after a delay of twenty-one months for proceedings of 1891, and nine months for 1892. (Jour. Comp. Med. XIV, 250.)

Of these 417 pages the Journal had published at earlier dates, 243 pages, or 58 per cent. (Jour. C. M. XII, pp. 495, 502, 587, XIII, 569, 643, 666, 673, 692, 749.)

The transactions of 1893 consisted of 385 pages, and appeared in a little less than one year after the meeting, at a total expense of about \$1,000.00, or deducting the charges for stenographer and an extra number of copies, a rate of about \$1.60 per page for 500 copies, from the effects of which the Publication Committee became moribund, if not



On motion it was recommended that the resignation of Dr. Henry F. Leonard be accepted, to take effect September, 1895.

The resignation of Dr. Theobald Smith, Professor of Comparative Pathology in Harvard University, and Bacteriologist to the Massachusetts State Board of Health, was presented, and on motion it was recommended that his resignation as an active member be accepted, and that he be elected to honorary membership.

The charges of violation of the Code of Ethics preferred against Dr. John Faust in 1896, and referred to Dr. T. B. Rayner for investigation, were now taken up. The defense claimed that the actions complained of occurred twenty years ago. On motion, it was recommended that the charges be dismissed.

Charges were filed against Dr. G. E. Griffin for violation of the Code of Ethics by advertising proprietary remedies, and upon motion, the Secretary was directed to notify Dr. Griffin of the charges, and to cite him to appear before the Executive Committee meeting in 1898, and show cause why he should not be expelled.

The Secretary was directed to take similar action in the case of charges preferred against Dr. Junius H. Wattles, for violation of the Code of Ethics.

On motion a committee of three was appointed to confer with the Association of Veterinary Faculties of North America and the Association of Experiment Station Veterinarians, regarding the advisability of these two organizations becoming affiliated with the United States Veterinary Medical Association. The Chair appointed Drs. Williams, Pearson and Stalker as this Committee.

It was moved to divide Wednesday's meeting into two sections, one on State Medicine, the other on General Practice. On motion, the question was postponed until the meeting of the Committee on the morning of the 7th.

S. STEWART,  
Secretary.

TULANE HOTEL, NASHVILLE, TENN., 9 A. M. SEPT. 7, 1897.

The adjourned meeting of the Executive Committee was called to order by Chairman Hoskins.

Members present: Drs. Bell, Cary, Hinkley, Hoskins, Osgood, Pearson, Rayen, Stalker, Stewart and Williams.

Absent: Drs. Howard, Robertson, Salmon, Trumbower.

Applications for membership by A. W. Bitting, D. V. M., Lafayette, Ind.; F. T. Eiseman, M. D., D. V. S., Louisville, Ky.; and J. R. Mitchell, D. V. S., Evansville, Ind., were presented, and upon motion, favorably recommended.

The committee appointed to confer with the Association of Veterinary Faculties and the Experiment Station Veterinary Association as to the desirability of affiliation reported that it did not seem feasible to affiliate with these organizations.

Moved by Dr. Williams to recommend that the Association of Veterinary Faculties be offered thirty pages and the Association of Experiment Station Veterinarians fifty pages in the proceedings of the U. S. V. M. A., the same to be edited and furnished typewritten within ten days after the close of the annual meeting. Carried.

The motion to divide into sections was taken up for consideration, and lost.

It was then moved and carried to recommend that the subjects relating to State Medicine be advanced on the programme, and be considered at an evening session on Tuesday.

Adjourned to meet at 9 A. M., September 8, 1897.

S. STEWART,  
Secretary.

On motion the rules were suspended and the Secretary instructed to cast the ballot of the Association for the applicants for membership and they were declared elected.

The several recommendations of the Executive Committee were separately approved and the report adopted as a whole.

#### REPORT OF FINANCE COMMITTEE.

Dr. Hoskins, Chairman of the Finance Committee, reported as follows:

an outgrowth of the U. S. V. M. A., and should be regularly affiliated with us.

Last year the Association of Experiment Station Veterinarians was organized during our meeting, and this year they hold their meeting immediately upon the close of ours.

Your committee respectfully suggests that steps be taken at this meeting to consider the formal affiliation of these two bodies with the U. S. V. M. A., and the regular inclusion of their proceedings with those of the parent organization, as it would greatly add to the value of the publications of our Association.

We respectfully submit the following estimate of expense on account of the Publication Committee for the present meeting:

Stenographer, 3 days at \$10.00.....	\$ 30.00
Transcript and carbon copy of stenographer's notes at 37 cents per page.....	74.00
Printing transactions, 250 pages at \$1.03.....	258.00
Postage.....	30.00
	<u>\$392.00</u>
By making an extra session for one-half day, an additional cost of	20.00
	<u>\$412.00</u>
By publishing 60 pages for Experiment Station Association and 30 pages for Association of Faculties.....	90.00
Extra postage.....	12.00
Stenographer and typewritten notes.....	50.00
	<u>\$564.00</u>

This maximum estimate is virtually based upon a five day's meeting at an expense of \$115.00 per day.

Your committee desires further to call your attention to the chaotic state of the archives and property of our Association.

It has been the custom to publish a greater number of copies of our transactions than we had members, with the result that numerous copies are left over, some have been sold and others are presumably on hand and subject to the Association's orders; but so far as your committee is aware there is no published official information extant as to how many copies of any one or all years remain on hand, where

or in what condition they are kept, nor do we find any record of the number of copies sold. In fact it appears we have no official whose duty it is to keep or account for this property, our constitution and by-laws apparently not contemplating the ownership by the Association of any property possessing a monetary value.

Doubtless this property is all safe, and every penny received from the sales of copies of transactions, is in our treasury; but we suggest that the time for presumption has passed, and we should have a responsible custodian for this property who shall report annually its amount, condition and value, and that we should provide a permanent repository for such property where it will be convenient, secure and out of the way of individual members.

We therefore recommend the creation of a permanent repository for our archives, with a custodian to be known as "Librarian," who shall be elected for an indefinite term.

We further recommend that such librarian be authorized to sell any extra copies on hand at a uniform price of 60 cents per 100 pages, net, with a discount of 15 per cent. to dealers.

We would also recommend that the Publication Committee be granted twenty-five copies of the proceedings annually, for distribution among the various medical journals, or to be disposed of in other ways which may in their judgment benefit our profession.

With these conclusions and recommendations before you, we feel, after three years of arduous labor, during which time we have endeavored to bring about substantial progress in our work, and when after a few more weeks, we shall have forwarded to each of you the printed transactions of this meeting, that we shall have fulfilled in due measure our duties in this work, and trust that abler hands may then take it up and carry it forward with ever increasing efficiency, and in a manner befitting our association and profession.

Respectfully submitted,

W. L. WILLIAMS,

Chairman.

## DISCUSSION.

It was moved by Dr. Cary and carried that the offer of Dr. Law, of Cornell University, be accepted, and that Prof. Williams be appointed custodian of the archives.

Dr. Hoskins: There are in the possession of the Association to-day a large number of copies of the several years' proceedings which I think could be judiciously distributed among the public libraries of the country and to the various medical organizations, where they would be disseminating knowledge of the work we are doing; through boards of health, at whose doors we are continually knocking for admission, if they were made conversant with what we are doing, it might cause them to recognize us in the fields of work which we claim belong strictly to the veterinarian.

There is little opportunity of selling them, for I think I could be perfectly safe in saying that less than thirty dollars has been received for reports during the four years in which they were published.

I am very happy that they are going to be placed in more secure quarters than they have been for many years, as some of them might become lost or injured; they are in peril of fire at all times in my own building; they are not insured in any way, and I am charged with a certain responsibility for them, that I shall be very happy to be relieved of; but I do think we should give to the Publication Committee the power to distribute them, and in order that this matter may be properly before the Association, for consideration, I move you that the Publication Committee, in conjunction with the President, may distribute these copies, reserving not more than twenty of any one year, where they will do us good and where they will serve some more useful purpose than becoming moulded in our possession. Carried.

On motion the report was accepted.

## REPORT OF COMMITTEE ON INTELLIGENCE AND EDUCATION.

The Committee on Intelligence and Education, Dr. H. D. Gill, Chairman, submitted the following report:

It is with a great deal of satisfaction that we report the steady advance to a higher curriculum in the various colleges of the United States, an advance more rapid than one could have anticipated.

To-day we have seventeen fully equipped veterinary schools all of which have established a three years' course with the exception of three.

We are extremely sorry to have to report that the Ontario Veterinary College finds it impossible to advance to a three year course but promises to do so next year.

We can say without fear of contradiction that there exists increased efficiency on part of lecturers as well as increased requirements in college curriculum.

Its results are already appreciable in the increased attainments of graduates, evidenced by their ability to successfully and creditably pass the U. S. Civil Service, as well as state and other professional examinations.

We also notice that the chairs of Meat Inspection, Bacteriology, Canine Diseases, etc., have been added to their courses.

Recognizing the needs of stronger professional men at the heads of veterinary schools, we report with a great deal of pride that Dr. Leonard Pearson has been made Dean of the Veterinary Department of the University of Pennsylvania, and Dr. Grange, Dean of the Detroit Veterinary College.

New York state and Ohio offer tuition free to their students and have established a three years' graded course of nine months each. This is indeed a boon to the veterinary profession, a help to ambitious young men of limited means, but at the same time is a menace and means financial ruin to self-supporting veterinary colleges of those states, more than one of which have been maintained by the gratuitous services of its Faculty. The institutions named are supported by state appropriation, and we see no reason why citizens of those states should not have the benefit of such an appropriation and be taught free.

To-day we have twenty-six Agricultural Colleges maintaining a chair of Veterinary Science where the work in this line is done by one man, and the teaching must necessarily be of an elementary character.

Much has been said as to the recognition of students coming from such colleges, and it is our opinion that some allowance should be given them on entering regular veterinary schools but not more than one year.

Agricultural Colleges have added greatly to English veterinary literature and their Bulletins have been very instructive, showing a higher character of work than heretofore, and nothing but praise can be given such men as Williams, Stalker, Reynolds, Dalrymple, Connoway, Cary, Grange and many others, and we think it a mistake that in one or two instances Experimental Stations have been discontinued; this is to be regretted.

During the past year quite a number of good books and many worthy translations have been added to the English veterinary literature; these were sorely needed and the writers should be encouraged.

The U. S. Department of Agriculture, Bureau of Animal Industry, has from time to time issued bulletins on original work and their efforts are growing more appreciated and accepted all over the world. It gives employment at the present time to about 150 veterinarians.

The spirit of economy exhibited by the last administration prevented to a very great degree the extension of meat inspection, and fixed a basis of salary to veterinarians too small to offer inducement to some of the best men. We hope however before another year to learn of an appropriation sufficiently large to not only extend their good work, but to increase professional wages commensurate with the responsibility of the position.

Since March 7th, 1893, the President of the U. S. has extended the classified service until it now includes the Chief of the B. A. I., Chiefs of Divisions, Superintendents, Chiefs of Officers, all Superintendents of Quarantine Stations, Inspectors, Assistant Inspectors, Microscopists, Assistant Microscopists, Meat Taggers, Stock Examiners, and Live Stock Agents; in fact every office in the Bureau of Animal Industry and every position in the whole Department of Agriculture is made subject to competitive examination, except those officers appointed by the President, namely,

Secretary and Assistant Secretary of Agriculture and Chief of Weather Bureau.

In the report of the Honorable Secretary of Agriculture for 1896 he says that Chiefs of Bureaus and Divisions since the classification, are unanimous in praising the enhanced value of the service rendered by their assistants and employees. In efficiency and economy the classification has very visibly improved the work.

The B. A. I. includes two business offices, 152 Technical Stations engaged in Meat Inspection, and Quarantine work, and three laboratories for investigating the diseases of animals and the causes thereof.

There is probably no scientific and practical institution working along similar lines in this or any other country that has made more rapid development or accomplished work of as much general value as the U. S. Bureau of Animal Industry since its organization in 1884, continuously under the direction of its present competent and worthy Chief, Dr. D. E. Salmon.

I can recall no single act of the President that has so tended to the improvement of both the personnel and efficiency of the working force of the Bureau, as placing the employees thereof in the classified service. Since political preferment by this act has been relegated to the past, and the competent employee is not constantly haunted by fear of removal, he applies himself to the duties of his office with the same zeal and energy as if the profits of his labor were his own.

Such a condition as hereby established in the Bureau of Animal Industry would have made impossible the shameful occurrences in our profession as that of the States of Illinois and Michigan and the city of Nashville, in the removal of eminently fit veterinarians and the substitution for them of non-graduates. This not only robs the states of the advantages of the knowledge, skill, scientific and practical contributions of qualified men, but renders its citizens dependent upon machine appointees who are rarely of use except to themselves and the machine.



Veterinarians are slowly but surely recognizing the fact that the only way to advance their calling and make apparent to the public their real worth is by unity, and we are pleased to note that there are strong societies in nearly every state in the union and that their power is now being felt.

Look at what has been accomplished by the local and state societies in Pennsylvania! The members are all earnest workers; they are united; their differences (if they have any) are settled at meetings; if they need money each and every member cheerfully subscribe and what is the result? They have gotten appropriations from the state for original investigation and the members who helped bring about this recognition of the profession have been rewarded by having the work distributed among them and the public health is now being protected by competent scientific men.

While the cost of this protection to the public health and live stock interests exceeds \$12,000 per year the advantages are so apparent that the public is well pleased with the expenditure.

Pennsylvania is a good example. What they have done can be done by other societies.

H. D. GILL,  
Chairman.

DR. H. D. GILL, Chairman of Committee on Intelligence and Education:

DEAR DOCTOR: Journalism, as an important medium of professional education, is a subject which should ever be kept prominently before the mind of each individual member of our profession. There is the possibility, or perhaps I ought to say tendency, on the part of many of us to forgetfulness of this fact, with the result that we are apt to retrogress rather than progress along the different lines of our professional work. There is no profession or business to-day, that can expect to succeed without its periodical literature. Text books, devoted to either branch of medical science, are invaluable, in that they contain the fundamental facts, so to speak, on which practice is based, but in these days of such wonderful advancement, more especially perhaps in the

department of medicine, a considerable portion of a text book may be said to be out of date by the time it is placed upon the market. This would be an exceedingly unfortunate occurrence for the profession, were it not that our journals come in to fill the void. The veterinarian at the present day who is not a subscriber to one or all of our journals, and perhaps to one or more of the European periodicals, is behind the times; and by being in such a position, is not only doing an injustice to himself, but to his profession.

I am of the opinion that the veterinarian should subscribe to a leading medical journal as well as to those of our own branch; it keeps him in touch with what is going on in the sister profession; and by having a little more extended information on the general subject of medicine, it not only adds to his own knowledge, but it gives him a better standing with the members of the medical profession with whom he may be brought into contact, when he is able to discuss intelligently up-to-date topics having a direct bearing upon their subject. I have always been an advocate of the veterinarian, when he has the opportunity, seeking the friendship and association of medical men. I think a great deal of the ignorance which prevails in certain sections of the country, with regard to our profession, would eventually be dispelled through the influence of the medical profession, especially if they had a more intimate knowledge of us and our professional work. It has been stated that out of the entire veterinary profession in the United States, only about one-third of its members subscribe to the professional journals. This may, at first sight, appear an unimportant matter, but when duly reflected upon, is in reality a serious state of affairs. At the present time, although the information contained in our journals is of inestimable value to those who subscribe to them, these monthly periodicals are conducted at great financial loss; and in fact one of them has had to be discontinued altogether for lack of support. This want of appreciation on the part of a large portion of the profession is to be deplored, for the reason, that it not only acts as a check to professional progress in the non-subscriber, but it deprives those who do subscribe, and who are

anxious to keep up with the professional advancement of the day, of a great amount of valuable matter, which our journals are unable to avail themselves of for lack of the necessary support. In other words, it curtails the scope of journalistic work, thereby depriving the profession of a great amount of what might be termed its most needed sustenance, viz: current, up-to-date literature gleaned from various sources throughout the professional world.

No better method, it seems to me, could possibly be devised to so rapidly advance the interests of the profession than that of well conducted journalism. "The power of the press" is a saying as true as it is trite: and there is no valid reason why the same should not be said of our professional press from both a social and a legislative standpoint. One of the most pleasing features which a profession such as ours, ought to be able to afford, is sociability. This can be largely cultivated through the medium of our journals. As a body, we frequently require legislation to obtain some needed reform. This could often be accomplished through the same channel—our press—more especially if it had the sympathy and support of a solid profession. There can be only one of two reasons why the veterinarian fails to give his support to the journals devoted to his profession, and necessarily to his individual benefit; and the first of these is a lack of interest in his own intellectual development—from a professional point of view—and in the progress and success of the profession, as such: or, that he has persuaded himself that he cannot afford \$3.00 a year for a journal, the value of which, to him, it would be extremely difficult to estimate.

If we expect to increase in strength as a profession, we must endeavor to increase and keep increasing the power of our journals in every department; and this can only be accomplished by the sympathy and hearty support of the profession as a whole. It is only by liberally contributing, as well as subscribing, that we can expect to obtain and maintain a high standard of excellence in our professional journalism. It is to be hoped that each succeeding meeting of the U. S. V. M. A. will have the effect of inspiring new life

in the profession throughout the country, with regard to this important matter; and that each individual member will feel it to be his duty to lend his aid to the support of those professional periodicals, which are of such immense value, and which he has it within his power to greatly enhance.

W. H. DALRYMPLE,

Member of Committee on Intelligence and Education.

On motion the report was accepted.

#### REPORT OF THE COMMITTEE ON DISEASES.

The report of the Committee on Diseases, Dr. Theobald Smith, Chairman, was read by the Secretary as follows:

After accepting, somewhat reluctantly, the duties of the chairman of this committee, I set about to consider what could be done by such a committee which would be of benefit to the Association. I had in years past been asked by members to contribute something to the report; I had seen circulars issued for the purpose of collecting information concerning any and all animal diseases in all parts of the the country—a stupendous and probably useless task. I finally found that Chapter V, Art. III of the By-laws defines the functions of this committee as follows:

“It shall be the duty of the committee to investigate the character and extent of prevalent diseases throughout the United States, and report at each meeting.”

Here we have defined, pretty clearly, the duties of the committee on a vast subject, a subject which is attacked only in Germany with any success by the Imperial Government through its well organized veterinary service. The circumstances, therefore, warrant a few words of discussion upon the work of this committee and the results that may be expected from it.

If we put ourselves back ten or fifteen years, and consider the meagre sources of information accessible to the student of animal diseases, we might look upon the work of this committee, however superficial or inadequate, as supplying some gap and serving a useful purpose. To-day circum-

stances are greatly changed. Educational facilities have increased, and educational standards raised. There are more and better journals in circulation, which endeavor to give the subscriber a glimpse of the knowledge accumulated in other countries, as well as in this. Good foreign text books are being translated. But more than this, information concerning animal physiology and pathology is being disseminated from agricultural experiment stations and colleges throughout the whole country. The munificence of the National Government has flooded the intellectual market with free publications. Many Stations give opportunity for more thorough, original work to veterinary teachers. The Bureau of Animal Industry distributes free Reports on animal diseases. A wide-awake student may, through these various agencies, supply himself with nearly all the literature needed to keep himself informed of the movement of the diseases among animal life without waiting for the often laborious but usually barren annual reports of this committee. Lastly, the increasing importance of animal pathology is leading many engaged in it to seek higher fields of knowledge by travel and to acquire foreign languages which put them in direct communication with many of the sources of information.

From the standpoint of to-day then, I must consider the task of this standing committee a perfunctory one and its continued existence a slur upon the intellectual activity of the members of this Association.

There are other reasons why its work can be of little avail. In order to get information not already known through various channels, the committee must invade the private note-books of individual research. Why should not the report of interesting observations be left to the individual making them? Would any one care to publish valuable work by making this committee his mouthpiece? I think not. Nor should he do so. Any one who is engaged in investigations knows how undesirable it is to make any statements about uncompleted work or to entrust the announcement of results to any one else.

The need of the present is not diffusiveness, discursiveness, but concentration. Instead of seeking information upon a whole catalogue of diseases it would be far better to take some one disease or group of diseases upon which more information is needed and lay all the members under contribution, either for signed papers, or notes for the committee. Take the subject of the infectious swine diseases about which so much good, bad and indifferent has been written and about which there has been and still is so much useless controversy. Could not some such group of diseases be made the special work of a committee for a year, or the investigators be invited to go over special problems on controverted matters? Such a course would tend to clear away any erroneous impressions which envelop the mind like a fog and which cannot be dislodged by ordinary means. Such a course would furthermore stand in the way of irresponsible opinions so frequently made in these general reports which give a painful impression to all earnest workers. How frequently have I seen in print, statements made by veterinarians that this or that disease does not exist, that this or that germ is a myth, and the like, when any well informed person knows that it means staking a little irresponsible dabbling in a subject or a few random thoughts against years of continuous investigation.

In order to promote this concentration of work and thought upon some one theme, to give those who know something about it a chance to impart their knowledge and the grounds on which it rests and those, who do not know, the opportunity to listen and discuss and lay aside prejudice. The by-law as it stands needs revision, or the standing committee might be abolished and a committee appointed when some especially important subject demands attention. It is always well for an organization to have as little useless machinery as possible. It creates a certain amount of routine labor which stands in the way of individual effort in other more useful directions.

At the outset, it was my plan to take some subject like Texas fever and bring together the more recent investigations, especially those made in other countries, upon the

blood parasite of this disease, and upon the agency of the cattle tick in its dissemination. Two things stood in the way of this plan. 1, the by-law of itself and 2, the fact that one of the members of the committee had only recently published his investigations which were thus made accessible to all early in the year.

In compliance with the by-law creating this committee I have asked the members of the committee to prepare a very brief signed report, upon any unusual and interesting phenomena among animal diseases occurring in the United States. The reports of those who have responded to this request are appended.

THEOBALD SMITH,  
Chairman.

DR. THEOBALD SMITH, Chairman Committee on Diseases:

SIR: Owing to some fault of the mail service of Uncle Sam I did not know that I was a member of your committee until a short time ago. I at once sent out letters to a number of veterinarians asking for information but as yet have received but few replies. My report will, therefore, necessarily be very brief. As per your suggestion I shall confine my report to the South Atlantic states.

Although I have not received reports from all of these states, the usual diseases may be said to prevail to a greater or less extent. For South Carolina Dr. Wyman reports as follows: "The state work during the last twelve months revealed two cases of glanders, four outbreaks of hog cholera, seven cases of catarrhal influenza, ninety-seven cases of strangles, no Texas fever, but two outbreaks of haemoglobinuria in cattle, no anthrax, black-leg or tuberculosis."

For Georgia Mr. H. J. Wing, dairyman at the experiment station, reports that the only drawback to cattle raising there is Texas cattle fever.

Tennessee reports glanders to exist there to a very limited extent. Tuberculosis of cattle is also occasionally met with. Texas fever exists in certain portions of the state.

In North Carolina outbreaks of Texas fever and encephalitis of cattle have been reported during the past year.

In Virginia encephalitis has been more prevalent during the past year than for many years before. I have seen the disease in horses, cattle and dogs; and a few cases have been reported in hogs. This disease gives rise to many newspaper reports of "rabies." Whether the disease is communicated from one animal to another I am unable to say, but I am inclined to the belief that the majority of the cases are the result of a fungus being taken into the system along with the food or water in which there is decaying vegetation, as most cases can be traced to a bad food or water supply. Canine distemper, in all of its forms, was very prevalent in all sections of the state during the spring, and even now a few such cases are giving rise to "mad dog" scares.

Rabies does not exist in Virginia, and it will take better evidence than has ever yet been produced to convince me that it exists anywhere else.

Glanders is practically unknown in this state. I have not seen a case since I have been in the state.

Infectious pharyngitis made its appearance in the cities in the spring of 1896 and in 1897 extended to almost all sections of the state. The majority of the cases were mild and responded quickly to treatment, while in other cases troublesome, though not serious, complications arose.

The usual forms of distemper exist in some portions of the state nearly the year round.

Contagious pleura-pneumonia of the horse is reported to be of frequent occurrence in the sales stables in the cities.

Osteoporosis is quite prevalent in Eastern Virginia but does not occur in the mountainous sections of the state. Although I have had no opportunity to do experimental work with this mysterious disease I am strongly of the opinion that the cause is properly attributable to a fungus.

Rheumatism of the horse also frequently occurs in the lower sections of Virginia but is of rare occurrence in the mountains.

Hog cholera occurs almost annually and, while there are comparatively few hogs raised in Virginia, the loss is quite a serious matter to our farmers; since the majority of them depend upon their hogs for their winter's supply of meat.



I do not know that anthrax occurs in the state. Symptomatic anthrax is occasionally met with.

Texas cattle fever has been the most serious drawback to the cattle industry and prior to 1896 occurred in nearly all sections of the state, but since the enactment of the state law the disease is confined to the quarantined area where it frequently exists on the non-infected farms. Many cases arise which lead us to ask the question: Is the so-called parasite in the blood of Texas fever patients the actual cause of the disease or only a result of the disease? I must confess that some circumstances point to the latter. Field work is very different from laboratory work and different results are often gotten.

Respectfully submitted,

E. P. NILES,

Member of Committee on Diseases.

DR. THEOBALD SMITH:

MY DEAR SIR: I have heard of no unusual occurrences in that connection.

Bovine tuberculosis we still have with us. It seems to me that we shall make but little headway in its eradication from our herds until we realize the relation that infected stables bear to its propagation. With tuberculin as a diagnostic and a simple but effective disinfectant, I am inclined to believe that it might be held in check. So far as I am aware there have been found about the usual number of cases of glanders among horses. Rabies occurs about as frequently as formerly. Last January (1897) we had an outbreak among dogs in Amherst. There were some six or eight cases. An order from the town authorities requiring that all dogs be muzzled for two months sufficed to arrest its spread. Among some of the specimens that have been sent to me from different parts of the state I have found entero-hepatitis in turkeys—also one badly infested with tape worm. I have found intestinal parasites present in many instances of autopsies of fowls. In fact death in many cases seems to be due to them.

JAS. B. PAIGE.

On motion the report was accepted.

Dr. Hoskins announced an informal meeting of those connected with the State Boards of Veterinary Medical Examiners at 7 o'clock P. M.

Meeting adjourned until 2 o'clock P. M.

*Afternoon Session.*

Association was called to order by the President at 2 o'clock P. M.

REPORT OF THE COMMITTEE ON ARMY LEGISLATION.

The Secretary read the following report of the Committee on Army Legislation, Dr. J. P. Turner, Chairman:

MR. PRESIDENT: Your Committee on Army Legislation begs leave to submit the following report of their work during the past year:

Three months previous to the assembling of the second session of the 54th Congress (Dec., 1896) we had 5,000 circulars and 700 letters printed.

The circular contained a copy of the Army Veterinary bill before Congress; (See Proc. U. S. V. M. A. of 1896, p. 23) the highly favorable report of the House Military Committee, together with many economic reasons why the bill should become a law. In the letters, we made an appeal to the veterinary surgeons of the United States, asking them to personally interview the Congressman from their respective districts and the United States Senator when possible.

When Congress convened in December, the Committee called on Gen. J. A. T. Hull, of Iowa, the Chairman of the House Military Committee. We were assured by Gen. Hull that our bill would be called up from the calendar on the first day the Speaker would give the Committee. Your Committee had so many members favorably disposed that the bill would have passed on its merits at any time, had the Chairman of the Military Committee been able to get it up.

The extra appropriation required by the passage of the Army Veterinary bill amounted to \$7,200 a year, quite an insignificant sum to make the veterinary corps effective.

Had it been but \$72 a year, the result would have been the same.

We still have our friend, Gen. Hull, as the Chairman of the House Military Committee, and as the bill has passed the Committee at a previous session, it will be favorably reported early and get a good place on the calendar.

Should the tariff law recently enacted prove a revenue producer, legislators will go to work and pass many of the really meritorious bills which have been dragging along for years.

The bill as it now stands is the same as previously reported (Proc. U. S. V. M. A. 1896, p. 23) except Sec. 1 the words "of cavalry" are changed to "mounted" and Sec. 2 to each regiment of cavalry "to fourteen."

In concluding this report your Committee calls the attention of the Association to the loss we have all sustained in the death of our fellow committeeman, Dr. John R. Hart. While the Chairman of this Committee was a fellow student with Dr. Hart, he learned to love and respect this most honest and generous of men, and in those days he often spoke of the Army Veterinarians and of their efforts to raise the profession in the Army. When in after years, the President of this Association placed him on this Committee, Dr. Hart threw all his energies into the cause, and spent much time, thought, labor and money most unselfishly, simply for his love for his profession and where there was an opportunity of doing good and to those of us who knew his private life, this was his cardinal principle. This Committee will greatly miss his generosity, hard work and many encouraging words.

J. P. TURNER,  
Chairman, Fort Meyer, Va.  
AUSTIN PETERS,  
Jamaica Plain, Boston, Mass.

On motion the report was accepted.

The Committee on Incorporation, Dr. A. W. Clement, Chairman, reported no progress.

Dr. Hoskins: I would like to make known to the Committee on Incorporation a fact that came to our knowledge

within the last hour or two, that there already exists in this country a National Incorporation, the National Association of Veterinarians, granted by Congress, and I learn that the Charter is the possession of Dr. T. B. Cotton, of Ohio. It was granted by Congress some years ago, somewhere possibly about 1885 or 1887, and I would suggest to the Chair that the Committee on Incorporation might start in on this line and work out the solution of their problem through a conference with Dr. Cotton.

Dr. Pearson, reporting for the Committee appointed to draft resolutions of thanks to Buffalo Veterinarians and citizens, stated that the following resolutions were suitably engrossed and sent to Dr. Hinkley, Chairman of the Local Committee of Arrangements:

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

1896.

WHEREAS, the thirty-third annual meeting of the United States Veterinary Medical Association held in Buffalo, New York, September 1st, 2nd and 3rd, 1896, was one of exceptional interest and profit to the entire veterinary profession and the general health and live stock interests associated with it; and,

WHEREAS, this extremely important and gratifying result, which has influenced sanitary work in all parts of the country, was freely contributed to and largely dependent upon the excellent facilities and generous hospitality offered by the City of Buffalo and its citizens; and,

WHEREAS, This convention which is the largest and most representative gathering of veterinarians that has ever met on this continent has been profoundly impressed by the beauties and advantages of the city, and the spirit of progress and civic pride that dominates its citizens; and

WHEREAS, the representatives of the veterinary profession in Buffalo and western New York by their untiring energy, constant courtesy and well directed efforts, have contributed to the success of this most fruitful meeting of the Association

to such an extent that their good influence will be felt for many years; be it

*Resolved*, That this Association in convention assembled make public acknowledgment of their appreciation of the assistance, courtesy and hospitality received by it in Buffalo and tenders its sincere thanks to the municipal authorities, the press, the medical profession and the veterinarians; and be it further

*Resolved*, That these resolutions shall be spread upon the minutes and a copy shall be presented in an enduring form to the Chairman of the Local Committee of Entertainments.

W. HORACE HOSKINS,

President.

F. H. OSGOOD,

President-Elect.

LEONARD PEARSON,

Chairman of Committee on Resolutions.

S. STEWART,

Secretary of Committee.

The following reports of Resident State Secretaries were read by title:

#### CONNECTICUT.

MR. PRESIDENT: The laws regulating the control of glandered horses have been very materially altered; the entire matter is now under the supervision of the Humane Society, giving them a legal right to enter and inspect any place where they may have reason to suspect the existence of a glandered horse; the right to quarantine and the power to slaughter all animals that are pronounced diseased by a competent veterinary surgeon employed by the Society. This decision is final unless the owner calls a consulting veterinary within forty-eight hours; then, if an agreement cannot be reached, a third veterinary shall be consulted at the expense of the state. All veterinary surgeons so employed must be graduates of recognized colleges and practitioners in the state for two years.

During the past year the state cattle commission report an inspection and test of 6,304 head of cattle for tuberculo-

sis, of which number 897 were condemned and killed, or 14.2 per cent., at a valuation of \$21,807.40, or an average valuation of \$24.47. The amount of disease in the different counties varies considerably, those districts having the largest cities having the highest per cent. Hartford County averaged 28.4 per cent., 804 being examined; New Haven County averaged 29.4 per cent., 136 examined; Litchfield County, among the hills where the towns are small and scattered, averaged 9.9 per cent., 4,249 being examined. In its annual report the commission states that experience had lead to the conclusion that the disease might be stamped out.

Several reacting animals have been placed at the State Agricultural College for the purpose of experiment, to estimate how long a course the disease may pursue, or if continued inoculation may have any power towards perfecting a cure.

All the advantages gained by the past year's work, costing the state over \$31,000, seems to be that of making the buyers more careful and to bring about an improved class of dairy cattle.

As soon as the legislature assembled and was in order for business the 1895 laws were repealed, leaving the entire state unprotected from January until June. At the close of the session, laws were enacted better suited to the ideas of cattle dealers, resulting in the appointment of one Commissioner by the Governor; the same must be a man of at least five years experience as a practical farmer, the Commissioner having the power to employ the necessary assistants to carry out the provisions of the law. He shall within six days inspect all animals entering the state; they must pass a satisfactory physical examination. He must examine, or cause to be examined all animals reported or suspected of having tuberculosis. Where an animal has been pronounced diseased by physical examination, it must be destroyed after a valuation has been reached between the owner and Commissioner.

The veterinary profession again ineffectually attempted to gain recognition by the legislature.

The state has been comparatively free of diseases of a contagious nature during the past year. Hog Cholera still seems to suddenly appear in locations and ravage our swine industry. Strangles was especially prevalent during the spring.

Newspaper stories have been now and then forwarded me relating outbreaks of Rabies. Danbury, about last September, was thrown into intense excitement over a mad dog scare. Dr. Bland, of Waterbury, forwarded me a report of a case of Rabies followed by a dozen or more well developed cases, all traced back to a tramp dog that appeared about the streets some few months prior, biting many dogs and cats.

I will speak of a rather peculiar case that came within the range of my practice during the year. A thoroughbred Jersey cow gave birth to two calves, born at an interval of nearly four weeks, the first one born June 29th, a heifer and well marked Holstein; the second born July 23rd, a pure Jersey bull, to all appearances,

According to the owner's careful consideration, the only solution of the Holstein seems to be in the fact that one year ago the cow gave birth to a calf that was sired by a Holstein bull and the traits and marks of that animal have been conveyed to the offspring of the Jersey sire.

RICHARD P. LYMAN, M. D. V.,

Resident State Secretary.

DELAWARE.

SECRETARY U. S. V. M. A.

DEAR SIR: For the past four or five years we have been troubled every summer with anthrax, which we have at present fairly well under control by the efficient aid of the Delaware College Experiment Station. We have this year, a law which allows the owner and loser of a cow or horse from anthrax, eight dollars, provided he cremates the carcass under the direction of the Experiment Station or the Acting State Veterinarian, also an allowance for vaccination of the infected herd. We attribute the cause of our outbreaks of anthrax to our numerous morocco factories.

Every few weeks I am called upon to investigate outbreaks of rabies, which disease exists and has existed in our midst for several years, especially the past five or six years, principally among cattle. The disease most dreaded is the so-called cerebro-spinal menengitis. We have more than our share of this and we are perfectly at sea as to its cause. I find it in marshy, and in high, hilly districts, in pasture and in the stables, in poorly drained and ventilated stables, and in the best drained and cleanest. We lose yearly thousands of dollars worth of horses. I advise the animals removed as soon as the disease is discovered, spray the stables with chloride of lime and allow them to be unoccupied for a week or two.

Tuberculosis we have in the past few years, by the wholesale, reaching in a few herds, 75 to 90 per cent. The tuberculin test has been practiced faithfully, and good results obtained.

Tetanus is on the decrease.

Our people are gradually recognizing the fact that veterinarians merit attention. We have, by efficient assistance of the Experiment Station, advanced theories and facts, and proven them so conclusively that we are surely and gradually gaining ground.

Yours truly,

H. P. EVES,

Resident State Secretary.

#### INDIANA.

MR. PRESIDENT: Throughout the year glanders and farcy have prevailed in the northwest portion of the state to a varying degree. At times seeming almost totally eradicated, it breaks out in a new place when least expected. At present there are in quarantine some 75 horses and mules, that have been exposed. During 1895 sheep in large numbers were brought into the state from the west, and since that date great loss has occurred among the young lambs from tapeworms. Many cases of tuberculosis have been reported, but the lack of adequate funds to make complete investigations has handicapped the work. Scabies in sheep has been



prevalent to a limited degree, and some few herds have been quarantined. This is now raised, however, and the flocks of the state are comparatively free from the disease.

Hog cholera has existed to a certain extent during the year though at present there is, judging from the health of the animals coming to the Indianapolis market, a cessation from its ravages. The number of cases of actinomycosis in native cattle is extremely small. The law regulating the Live Stock Sanitary Commission does not give jurisdiction over hog cholera to that body. There was a law passed however, at the last session of the General Assembly, making the railroad companies disinfect cars used by the company for the transferring of hogs to market. Upon examination, however, it seems that the law is faulty. It is at any rate not made compulsory for any one to see that the law is enforced. Consequently, at present the cars go infected often from the yards. The wisdom of such a law is beyond question, and it is to be hoped that ere long means to enforce it may be found.

The State Veterinary Association is in a fairly prosperous condition. The number of Veterinarians practicing in the state with Veterinary degrees is something over eighty, and though not all are members of the State Association, they are becoming more and more friendly toward closer union; realizing the truth of the old axiom: "In union there is strength."

There is one school in the state which grants the degree of V. S. This institution is located in Indianapolis, and is known as the Indiana Veterinary College. A three year course is promised in this school after the sessions of '97 and '98.

Respectfully,

THOMAS J. TURNER,  
Resident State Secretary.

## MISSOURI.

Dr. T. E. White, State Veterinarian, reports no contagion in Missouri except cases of glanders, which generally can be traced to some horse coming in from an adjoining state. It was attempted last winter to have the Legislature enact laws protecting the profession, but failed.

The State Veterinary Association is in a prosperous condition. A profitable and enjoyable meeting was held at Columbia in September.

St. Louis now claims a society of Veterinary Surgeons, which it is hoped will be a factor for good.

J. M. PHILLIPS,  
Resident State Secretary.

## NEBRASKA.

Actinomycosis was only reported to our Department in a very few instances, three counties in all. Some of the ranchmen claim that this malady is rapidly disappearing from the herds since dehorning has been practiced. In Sheridan county 15 head have been treated with the government prescription and good results have been obtained. The other counties gave no treatment, with the exception of Polk county, where the use of Honstott's Capsules was attended with fairly good results.

Anthrax has appeared in Polk county, on the Blue River. Three of the animals died but the remainder of the herd was immediately changed to another pasture and vaccinated and and no further deaths occurred.

Black Leg appeared in 23 counties, some losing as high as 20 head. The reports of treatment are numerous and varied. Some of the most striking are rowels dipped in turpentine or setons dipped in turpentine and put into the brisket to cause suppuration. Others used drenches, made of a strong decoction of tobacco. Gordon, a private individual, is manufacturing a vaccine similar to that of Pasteur. He is a retired physician and his vaccine is being used with very good success in his neighborhood.

At Lena, McPherson county, a gentleman by the name of W. B. Brookings has experimented with the Pasteur vaccine. The following table shows the results of his work:

NAME.	Date.	Number Vaccinated Yearlings.	Loss after Vac.	Per cent. loss from Sept. 96- Mch. 97.	Per cent. loss in former years.
W. A. Brookings.....	Mch. 17, 1897	31	0	0	1 to 33½
W. C. Roberts.....	Mch. 18, "	24	0	4	4 to 8
Ed. Huffman.....	Mch. 27, "	81	0	0	1 to 2
Haney Bros.....	Mch. 29, "	52	0	12	1 to 6
Wm. Wright.....	Mch. 31, "	25	0	0	2 to 12
		Calves.			
Haney Bros.....	Apr. 23, "	172	0	0	0
Ed. Huffman.....	May 9, "	95	0	0	0

Mr. Brookings says: "Three years ago I lost one-third of my bunch. My work has extended over a large territory with perfect results. There were parties living close to some of the above ranches who were a little skeptical last spring and have lost heavily later. Those living near one of the ranches have lost from 10 to 14 per cent. within the last six weeks, and two men living within ten miles of my place have lost 6 to 8 per cent. There have been no bad results whatever, from swelling or otherwise from the vaccination and I have watched the above bunches closely."

Corn Stalk Disease has been quite prevalent in this state. It seems that this year there has been a greater affection of the horses than in former years. The advice that has been given for preventing the ravages of this disease is that the animals should receive a grain ration before they are allowed to gorge themselves on the corn stalks. Where this advice has been followed the animals seem to feed upon the stalks with impunity. There is still a great belief in the theory that salt and water will prevent animals from becoming affected but I have been thoroughly convinced that, whatever the cause may be, the disease may be prevented by feeding something other than corn stalks. From the numerous conversations that I have had with ranchmen, stockmen and feeders I am convinced that this will be a disease of the past so soon as they do not allow the animals to run continuously on the corn stalks and derive their whole nourishment from the same.

Keratitis has been reported among cattle in certain localities of the state. It seems to affect the animals while in the pasture. The disease is described by stockmen as follows: The animal will be seen to be uneasy and, if the left eye is affected, will hold the head down and try to drive away with the left foot the object that seems to them to be on or covering the eye. On the third day the eye generally becomes watery and in very bad cases a little speck is found on the cornea.

The disease generally runs from twenty to thirty days if not treated. The disease may affect one or both the eyes, the majority of cases reported to us were that only one eye was affected and very few of the animals lost their vision. The cause of the disease is disputed; some of the stockmen claim that it is caused by the weeds or gases that come from damp, marshy pastures; others claim that it is a fly that deposits some matter on the cornea and this causes the ulceration. As far as I am able to find in the literature of the subject Professor Nocard and Professor Guittard did not succeed in transmitting the disease from one animal to another, still the French veterinarians class this malady as contagious. The animals that are affected are very much emaciated and their general appearance gives the impression of an unhealthy animal. Breeders have stated to me that these same animals that were affected, when transferred to better pastures recovered in from seven to ten days.

**GLANDERS.** Glanders has been reported in sixteen counties in our state. Of these I know nine cases to have been destroyed. With some of these latter the mallein test has been made with the result that these animals were found to be infected.

It has lately been reported that a man named Bowers, of Antelope county, died of glanders. The physicians of that county have pronounced the case authentic and have condemned his horses.

**RABIES.** An outbreak of rabies was reported in Oteo county. Ten hogs, two milch cows, a mule and a horse were affected. They were probably bitten by the owner's

dog which one month before had left the place after showing symptoms of being rabid.

On June first Mr. A. Locker reported a similar outbreak among his cattle and hogs. After questioning the owner I found that on April 24th his dog had left and had not been seen since. This dog herded the cattle, and on the afternoon prior to his leaving he was seen to be very vicious with the cattle, running after them, snapping them in the hocks and legs and seeming to hang onto them for some time. The first cow died three weeks after the dog left. All seemed to manifest the same symptoms. I took the brain and part of the spinal chord out of one of the animals. We made an infusion of this and injected one c. c. into two dogs and a rabbit. This was done June 4th. The rabbit died June 21. Both dogs also became rabid and died, one on July 5 and the other on July 11.

There have been other outbreaks of rabies reported but the Department did not have an opportunity to investigate them.

**TUBERCULOSIS.** This disease has been reported to us from four counties. This was confirmed by the tuberculin test. I do not think that we have as much tuberculosis as they have in some of the other states but nevertheless I think the time is fast approaching when we shall have to take some measures against it, for as the state is beginning to develop the dairy interests there is danger of importing this disease.

Texas Fever has been reported from Seward county. Dr. Anderson was appointed State Veterinarian and I give his report in part. The disease had in all probability been imported through shipments of infected southern cattle from Siloam Springs, Arkansas, to Germantown, Nebraska. This shipment consisted of one car load and contained about fifty head of mixed cattle, all ages and sizes. They were placed in a pasture with about forty cows, twenty calves and twelve horses. The Southern cattle were kept in this pasture for about three weeks, when they were removed to another pasture containing about 160 head of stock cattle and ninety head of horses. In about a week they were removed to Butler county and placed with ninety head of horses but

no cattle. About this time the diseased cattle in the first pasture began dying rapidly. They continued to do so for nearly two weeks until the number reached twenty-nine. The cattle in the second pasture found to be infected were removed to the first pasture and an effort made to confine it within this district, and prevent the removal of stock from either place. A permanent quarantine was established embracing all territory containing any infected or exposed stock, and patrolmen placed all along the line. This successfully checked the disease and we have every reason to feel satisfied over the results, especially when we consider the fact that these Southern cattls were unloaded and pastured in the midst of probably as large a dairy and cattle community as we have in the state, besides there being nearly 2,000 head of stock pastured within a radius of three or four miles of this place.

A. T. PETERS,

Resident State Secretary.

#### NEW JERSEY.

A long standing abuse in our large cities is the permitting of the self-styled "Veterinary Dentist" to come into our midst and do the work that should be done by local veterinarians.

It is proposed to establish by legislative enactment a State Board of Veterinary Medical Examiners to consist of five members in good standing in the veterinary profession, each of whom shall have practiced veterinary medicine and surgery for at least ten years before their appointment by the Governor, the board to have power to adopt by-laws and regulations to carry into effect the provisions of the act.

The State Board of Veterinary Medical Examiners shall examine all diplomas as to their genuineness, and also each applicant for a license shall submit to a theoretical and practical examination, said examination to be oral or written, or both, such examination shall include veterinary anatomy, surgery, practice of medicine, obstetrics, pathology, chemistry, veterinary diagnosis, materia medica, therapeutics,

physiology, zootechnics, sanitary medicine, and meat and milk inspection.

The only law governing the practice of veterinary medicine and surgery in the state of New Jersey is Chapter XXIV of the Laws of 1889, approved March 4th, 1889. This act restricts the practice of non-graduates to those who had practiced for five years previous to the passage of the law and required all practitioners to register within six months after the passage of the act.

The general control of the contagious diseases of animals including those that cause only financial loss and those endangering the public health, veterinary sanitary science, meat and milk inspection and kindred matters unfortunately are under several different heads in New Jersey, to the detriment of the live stock interests and the public health alike.

The State Board of Agriculture has a certain direct or indirect authority over the live stock industry; the State Board of Health has control over all contagious diseases of animals with the single exception of one disease, namely, bovine tuberculosis, the legislature having created a special commission on this one disease. We also have a Dairy Commissioner whose duty it is to inspect milk and other food products.

Speaking in a broad and general sense I believe that the work done in New Jersey compares favorably with that in other states, but I do sincerely believe that a great deal of futile work and surplus energy is expended under our complicated system that could be more efficiently and satisfactorily managed to all concerned if directed by a properly constituted State Bureau of Animal Industry, having oversight of the entire animal industry as affecting the health and wealth of the state.

The Society for the Prevention of Cruelty to Animals is active in some of our larger cities. I have noticed a tendency on the part of some of the S. P. C. A. men to condemn glandered and other diseased horses, which it seems to me is quite outside the province of the suppression of cruelty.

I would like to see in New Jersey above all else one strong, united State Veterinary Medical Association which I am sure could do great things.

WM. HERBERT LOWE, D. V. S.,  
Resident State Secretary.

WASHINGTON.

As Resident State Secretary I beg to report for the State of Washington as follows: An epidemic of Cerebro-Spinal Meningitis occurred in the central part of the state during the months of January and February, one party losing twelve horses in less than two weeks.

Glanders is not on the increase only isolated cases being found here and there over the state. In some instances the history of the cases have been traced to the large camps along the railroads where horses used in doing the grading were kept. The state is entirely free from scab in sheep; last year 15,000 sheep were affected.

Actinomyces is reported from the central part of the state as spreading, although not very rapidly.

Many complaints have been sent to the office of the State Veterinarian in regard to the prevalence of Black-leg in the central, although not a single case has been reported from the eastern part of the state.

Along the coast on the west side of the Cascade Mountains horses in great numbers are affected with Heaves.

East of the mountains in seven years I have not seen a case. The climate along the coast west of the mountains is very warm and damp, while east of the mountains it is very dry, the difference in altitude being about two thousand feet.

I take pleasure in announcing the formation of the Washington State Veterinary Medical Association, formed at Seattle, July 2nd. This we hope may prove a success, although it is a large undertaking at present, when some of the members have to travel nearly four hundred miles to attend and there is not over a dozen veterinarians in the state.

S. B. NELSON,  
Resident State Secretary.



The President: I regret being obliged to report the death during the past year of three of our members: Dr. O. H. Flagg, (being I believe one of the Charter Members of the Association;) Dr. John R. Hart, an active and influential member of the Committee on Army Legislation; and Dr. Charles F. Douglas, graduate of the American Veterinary College from the West Indies, who died in Cuba during the past winter. I will appoint the following committees to draw up resolutions and present them as soon as possible to the Association. On the death of Dr. John R. Hart: Drs. Pearson and T. B. Rayner. On the death of Dr. Charles F. Douglas: Drs. Roscoe R. Bell and Ackerman. On the death of Dr. O. H. Flagg: Prof. Law and Dr. J. B. Rayner.

Dr. Salmon, Chairman of the Committee on Pastuer Monument Fund, reported that the Committee has collected about \$785.00, but very little of this has come from the veterinarians—probably less than forty dollars, and said, "I would like to have our profession make a little better showing if possible and while I am here at this meeting I hope every member present will contribute liberally so that this Association can go on record as having contributed to a very worthy object."

On motion the report was accepted. (See third day's proceedings.)

The President announced that the next business in order would be the discussion on Tuberculosis and State Medicine, and as Dr. Parker was not present to open the discussion he called upon Dr. T. B. Hinebauch, who presented a paper entitled: "The Action Experimentally of Tuberculin on Healthy Cattle."

Dr. Parker presented a paper on "State Control of Tuberculosis."

Dr. E. P. Niles presented a paper on "Municipal Control of Tuberculosis."

(See discussion on Tuberculosis.)

On motion by Dr. Cary it was determined to hold the banquet Wednesday evening.

Adjourned until Wednesday at 9 A. M.

**SECOND DAY—Wednesday, September 8.**

The Association was called to order by the President at 9 o'clock A. M.

**REPORT OF THE EXECUTIVE COMMITTEE.**

The Secretary presented the following report of the Executive Committee:

HOTEL TULANE, 8 A. M., SEPTEMBER 8, 1897.

Adjourned meeting of the Executive Committee was called to order by Chairman Hoskins.

Members present: Drs. Cary, Hoskins, Osgood, Rayen, Stewart, Williams.

Members absent: Drs. Bell, Gill, Hinkley, Pearson, Robinson, Salmon, Stalker, Trumbower.

Applications for membership by H. D. Fennimore, D. V. S., Knoxville, Tennessee; T. A. Geddes, D. V. M., Ames, Iowa; A. Gibson, V. S., Birmingham, Ala; and Maurice O'Connell, D. V. S., Holyoke, Mass., were considered, and a motion prevailed to favorably recommend.

Adjourned to 9 A. M., September 9th.

S. STEWART,  
Secretary.

On motion the report of the Committee was adopted.

On motion the Secretary was instructed to cast the ballot of the Association for the applicants recommended and they were declared elected.

The President appointed as a Committee on Resolutions: Drs. Pearson, Salmon, Hinkley, Stalker and Dalrymple.

**REPORT OF COMMITTEES ON OBITUARY RESOLUTIONS.**

Dr. Pearson, Chairman of the Committee on Resolutions on the death of Dr. Hart, reported as follows:

WHEREAS, It has pleased the Almighty to take from us our

late fellow member and associate, Dr. John R. Hart, of Philadelphia; and

WHEREAS, Dr. Hart was intensely interested in the progress of Veterinary work and the best development of the profession of which he was an honored member, and his loss has made a most serious void in our ranks; be it

*Resolved*, That we hereby express our deep sorrow and regret, and testify to the high character, personal integrity and generous good nature of the deceased, who was unremitting in his efforts to further the aims of this organization and who cheerfully, with great energy and high ability, performed all duties assigned to him. Be it further

*Resolved*, That we hereby tender our sympathy to the bereaved family; and be it further

*Resolved*, That a copy of these resolutions be spread on the minutes of this Association and one sent to the family of our late member.

THOS. B. RAYNER.

LEONARD PEARSON.

Dr. Law, Chairman of Committee on Resolutions on the death of Dr. O. H. Flagg, reported as follows:

WHEREAS, In the providence of God there has been removed from our midst a valued Charter Member of the United States Veterinary Medical Association in the death of Dr. O. H. Flagg;

*Resolved*, That this meeting hereby express its sense of the great loss to the Association, and to the community in which he lived, and of which he has long been an esteemed and respected member, and that we tender to his bereaved family the expression of our profound sympathy in their irreparable loss.

*Resolved*, That a copy of this resolution be spread on the minutes of the Association and one forwarded to his afflicted family.

JAMES LAW,

J. B. RAYNER.

Dr. Bell, Chairman of the Committee on Resolutions, on the death of Dr. Charles F. Douglas, reported as follows:

WHEREAS, It has pleased Almighty God to remove from our midst our fellow member, Dr. Chas. F. Douglas, of West Indies, it is hereby

*Resolved*, That in the loss of Dr. Douglas this Association has lost a valued member and true friend of the Veterinary Profession; and be it also

*Resolved*, That in this loss the Veterinary Profession loses a worker in a country where the Veterinary Profession can ill afford the loss; and be it further

*Resolved*, That a copy of these resolutions be suitably engrossed, forwarded to his family, and published in the Veterinary Journals of this country.

ROSCOE R. BELL,  
E. B. ACKERMAN.

The President announced the next order of business to be the election of officers, and appointed Drs. Peters, Schiebler and Gill, tellers.

Drs. D. E. Salmon and F. H. Osgood were placed in nomination for President. In behalf of Dr. Osgood, it was urged that the precedent had been established to re-elect a President for a second term if he had proven faithful and competent. To which Dr. Williams as an ex-President, who had served but one year, protested that the precedent was unjust and that its mention, year after year, tended to destroy the usefulness to the society of ex-Presidents who had served but one term, and urged therefore that the precedent be overthrown and that instead the President shall ordinarily serve but a single year.

Dr. Salmon received 29 votes.

Dr. Osgood received 23 votes.

The President declared Dr. Salmon elected President for for the ensuing year.

Drs. Thomas B. Rayner, W. C. Rayen and A. T. Peters were nominated for Eastern, Central and Western Vice-Presidents, respectively; Dr. S. Stewart for Secretary, and Dr. Wm. Herbert Lowe for Treasurer.

On motion the Secretary cast the ballot of the Association for the candidates and they were declared elected.

The President announced the next thing in order to be reading of papers.

Dr. Leonard Pearson presented a paper entitled "A Review of the Field of Veterinary Science."\*

Dr. Ellis read a paper on "Our Milk Supply."\*

Dr. Carey next presented a paper on "Osteo-Porosis." \*

At 1 o'clock P. M. the meeting adjourned until 10 o'clock A. M., September 9th.

At 3 o'clock P. M. the members and ladies met at the railway station and were carried by special train to Belle Meade Stock Farm where, under the genial guidance of Hon. John J. McCann a few very pleasant hours were spent viewing the highly-bred and illustrious horses and cattle, returning to the city at 6 P. M.

### THIRD DAY—September 9.

*Morning Session.*—The Association was called to order by the President at 11 o'clock.

The President: On Tuesday this Association voted to accept Prof. Theobald Smith's resignation as an active member and voted to elect him an honorary member. I find by looking at our Constitution and By-laws that the names of persons desired to be elected to honorary membership in this Association must lie on the table for one year unless there is a suspension of the By-Laws, which may be done at any meeting by the members of the Association for the election of an honorary member.

On motion the By-Laws were suspended and Prof. Theobald Smith was elected to honorary membership.

The President: We will now hear the report of the Executive Committee.

### REPORT OF EXECUTIVE COMMITTEE.

9:30 A. M. SEPTEMBER 9TH.

Adjourned meeting of the Executive Committee called to order by Chairman Hoskins.

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\* Consult index for page of papers and their discussion.

Members present: Drs. Bell, Cary, Gill, Hinkley, Hoskins, Osgood, Pearson, Salmon, Stalker, Stewart and Williams.

Members absent: Drs. Howard, Robinson, Trumbower.

The application for membership of Dr. John W. Jameson, V. S., of Paris, Ky., was considered, and on motion, favorably recommended.

Moved and carried, to recommend that one year's time be extended to members delinquent for two years' dues..

Moved and carried, to recommend that members delinquent for more than two years' dues, except in cases where extension of time was requested, be suspended, and the members notified that they will be reinstated upon payment of arrears to date of suspension.

Moved and carried, to recommend that members elect, who have failed to qualify, be dropped from the roll.

Moved and carried, to recommend that the accounts of delinquents suspended in 1896 be withdrawn from collection agency, and that the delinquents become eligible to reinstatement on payment of arrears to date of suspension.

Moved and carried to adjourn.

S. STEWART,  
Secretary.

On motion the Secretary was instructed to cast the ballot of the Association for Dr. J. W. Jameson and he was declared elected to membership.

The recommendations of the Committee were severally approved and on motion the report was adopted as a whole.

Dr. Parker: I want to say that charges of unprofessional conduct were made against me; that I had made remarks against the good standing of a member of this Association. If I have been guilty of any breach of the Code of Ethics I apologize to the Association. I beg to tender my apology to the Association.

Dr. Connaway and others then discussed Texas Fever extemporaneously.

On motion the Association adjourned at 1 o'clock to reconvene at 2:00 P. M.

*Afternoon Session.*

Meeting called to order by President Osgood.

Dr. E. P. Niles read a paper entitled "Veterinary Instruction in Medical Colleges." (See Papers.)

Dr. Williams read a paper entitled "Inhalation Pneumonia." (See Papers.)

Dr. A. W. Clement read a paper entitled "Rabies." (See Paper.)

## RESOLUTIONS.

Dr. Leonard Pearson, Chairman of the Committee on Resolutions, presented the following:

*Civil Service.*

WHEREAS, The growth and expansion of the Civil Service on the merit system of appointment has received our official approval from time to time; and

WHEREAS, Its continuance has demonstrated the wisdom and value of this method of selection for the public service, and has secured the best corps of workers the public has ever had in its employ; be it

*Resolved,* That we most earnestly urge its continuance, its higher development and further extension, and that we pledge our united support to our national, state and municipal officials who are charged with its execution and maintenance.

*Certificate of Tuberculin Test.*

WHEREAS, The sale of cattle for breeding purposes furnishes abundant and frequent opportunities for the dissemination of tuberculosis to uninspected herds; be it

*Resolved,* That all cattle sold for such purposes should, before going to their destination, have the tuberculin test applied, and a certificate in accordance with the facts, furnished by the proper sanitary officer of the state.

*Tuberculin Test.*

WHEREAS, The Tuberculin test has been proven to be the only reliable ante-mortem means yet discovered of determining the existence of tuberculosis in its obscure forms; and

WHEREAS, The repetition of this test on the same subject tends to lessen the characteristic reaction, thus producing non-responsive condition of the animal which may be mistaken for soundness; and

WHEREAS, These facts may be, and are taken advantage of by the irresponsible and unscrupulous to aid in the disposition of diseased animals; be it

*Resolved*, That the private employment of this test except as supervised by competent and responsible persons, is fraught with danger to the public.

*Rabies.*

WHEREAS, Rabies of dogs and other domestic animals prevails in certain sections of the United States; and

WHEREAS, This disease causes much distress and anxiety, both as a result of actual infection and from frequent unnecessary alarm through fear of the disease when it does not exist; therefore be it

*Resolved*, That the sanitary authorities of the various localities should take some action, both to allay unfounded alarm and to suppress the disease whenever it occurs.

*Veterinary Dairy Inspection.*

WHEREAS, The character of the milk supply of a city is of the greatest importance to the health of the public, and a contaminated milk supply is often followed by widespread suffering and numerous fatalities; and

WHEREAS, The wholesomeness of the milk supply is of equal importance with that of the water supply, for the improvement of which such intense efforts are frequently made; and

WHEREAS, Milk is contaminated in a great variety of



ways, some of them so obscure that they are frequently overlooked, and require expert knowledge for their detection, and the usual city inspection consisting merely in the detection of added water, is entirely insufficient for the proper protection of the public, and an inspection is required that includes the observation and correction of defects of all phases and stages of the operations of milk production and distribution; be it

*Resolved*, That a thorough veterinary system of dairy inspection is hereby recommended to all Boards of Health, with the belief that it will exert an important influence for the protection of public health, the preservation of infant life, and the betterment of the diet of the people through the increased consumption of safe and wholesome dairy products.

*Committee on Diseases.*

*Be it Resolved*, That the Committee on Diseases is hereby instructed to devote special attention to the subject of Osteoporosis and Rabies, especially to the distribution, prevalence and losses caused by these diseases, and to report upon the same to the next annual meeting.

*Municipal Abattoirs.*

WHEREAS, The small slaughter houses in the country districts, as well as in cities, are difficult of proper inspection and supervision, as they are so widely separated and are operated so irregularly; and

WHEREAS, Unscrupulous parties take advantage of this fact, to have animals in a diseased and unsound condition slaughtered for food at such places, thereby menacing the public health; therefore be it

*Resolved*, That the United States Veterinary Medical Association recommends the prohibition of small and widely scattered abattoirs, and the establishment of central slaughter houses with municipal ownership, if practicable, where constant and rigid supervision may be enforced.

*Thanks.*

WHEREAS, This the thirty-fourth annual convention of the U. S. V. M. A., now closing its sessions in Nashville, has received every courtesy and assistance from the local Committee of Arrangements, the Veterinarians of Tennessee, the citizens of Nashville, the Nashville and Chattanooga Railroad, and the authorities of the Tennessee Centennial Exposition, through their representative, Hon. John J. McCann; and

WHEREAS, This generous and hearty reception has greatly facilitated our work, and has made our visit enjoyable and profitable to an exceptional degree; be it

*Resolved*, That the thanks of this Association are hereby tendered the Veterinarians of Tennessee and the South and to the citizens of this beautiful city for the hospitality we have enjoyed; to the press of Nashville for their full and accurate accounts of our proceedings, and to Hon. John J. McCann for his untiring efforts that have so largely contributed to our comfort and entertainment.

On motion the foregoing resolutions were received and adopted.

The following papers were read by title: "Bacteriology," by Dr. George N. Kinnell; "Malignant Catarrh of the Ox," by Dr. A. Youngberg; and "The Use of the Actual Cautery," by Dr. Wm. Dougherty. (See Papers.)

On motion of the Secretary it was ordered that the papers read by title be printed in the proceedings of the Association.

The President: The question is now open as to recommendation as to where the next meeting of the Association shall be held.

Dr. Parker: It is now some years since the Association met in the extreme East or Northeast, of the United States. The last meeting that was held in Boston was a successful one and I extend to you a hearty invitation to meet there in 1898.

Dr. Peters: Mr. President, as one of the Western men I extend to you through the city of Omaha, through the Gov-

ernor of the State of Nebraska, through the press of the State of Nebraska, through the Exposition Commissioners of the Trans-Mississippi Exposition, and the railway companies of Nebraska, a hearty invitation to come and visit the West in 1898, and hold the meeting in Omaha.

Dr. Ellis: In the name of the great State of Missouri, and the Missouri State Veterinary Medical Association and the St. Louis Veterinary Medical Society, I extend to the United States Veterinary Medical Association a hearty invitation to hold its next annual meeting in St. Louis.

Dr. Gill: It seems to me some years since we have met in New York City and I extend you a hearty invitation to meet there in 1898.

The President: Gentlemen of the Association I know that you are tired, this has been a long meeting, I am not going to detain you by any remarks other than thanking the officers for their assistance and loyalty throughout the year in rendering me every assistance in their power to conduct the work of the Association in a satisfactory manner. I want to thank every member and visitor that has been present at our meetings during the past week for the close attention, the care which has been used by every man rising on the floor to argue to the point in question, and not to ramble. The discussions have been short, terse and to the point, and it is due to you that we have been able to close the meeting as promptly as we have to-day, having completed all the papers, the authors of which were present.

In closing I would say I take pleasure in handing over to our newly elected President, Dr. Salmon, the gavel, knowing as we all do that he has the interests of the Association at heart and that his experience renders him able to conduct the executive affairs of the Association as well as any one of our members.

Dr. Salmon on taking the Chair addressed the Association as follows:

GENTLEMEN: After the number of hours which you have spent in deliberation in this room, through the warm weather, I know you are all tired, and it would be an infliction upon you which I have no desire to make if I should

undertake to make an address upon this occasion. I simply wish to express my appreciation of the very high honor which you have conferred upon me, unsolicited upon my part, and to assure you that it will be my pleasure to do everything in my power to make the work of the Association for the coming year a success. At the same time I realize that without your help and without your constant co-operation, success will be impossible. I therefore beg of you to assist me as you have assisted our Presidents in former years, with your counsel and with your knowledge and with the able papers which you are able to present.

Dr. Osgood: I should like to offer a resolution and also a notice. I hereby give notice that I shall propose such amendments or alterations of the By-Laws at the next annual meeting as shall extend the voting privilege. Also a resolution; be it

*Resolved*, That this Association, The U. S. V. M. A., contribute the sum of fifteen dollars towards the Pasteur Monument Fund, from the treasury.

The President: The Secretary will make note of the notice of Dr. Osgood's proposed amendments or alterations of the Constitution and By-Laws. You have heard the resolution that the Association contribute the sum of fifteen dollars to the Pasteur Monument Fund. What is your pleasure?

On motion the resolution was adopted.

The Secretary: Mr. President, I have placed before me another resolution which should be presented at this time. A proposal to amend the By-Laws submitted by Dr. Leonard Pearson to change Article II, Chapter VIII, to read as follows: "The annual dues of this Association are three dollars, payable in advance."

The President: These resolutions in regard to the Constitution and By-Laws will lie over for one year. Is there anything further?

Dr. A. W. Clement: I offer a resolution amending the By-Laws to the effect that the President shall be elected for a term of two years instead of one year as at present. I also offer a resolution amending the Constitution by changing

the name of the Association from "The United States Veterinary Medical Association" to "The American Veterinary Medical Association."

On motion the Association adjourned for one year.

## DISCUSSION ON TUBERCULOSIS.

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### STATE CONTROL OF TUBERCULOSIS.

BY JOHN M. PARKER.

Before considering more fully the subject matter of this paper, you will pardon me if I stop for a moment to notice one or two stray thoughts that have occasionally occurred to me.

It has seemed sometimes in discussing this subject that there has been too great a tendency, among the members of the profession, to look upon everything as secondary to the question as to whether a cow reacted to tuberculin or not. It has seemed as if there had been too great a tendency to let everything else go, to pay no attention to anything except tuberculin and tuberculosis. I have often felt that this whole matter should be taken up in a broader, more general way; that the important question of wholesome milk should receive greater attention than it has. The work being done by the various sanitary boards should be broadened, and widened. They should pay greater attention to the value of cleanliness and light, ventilation and drainage. Tuberculosis is not the only evil to be avoided, and in attending to the surroundings all are helped and both consumer and producer are benefited.

Again it has seemed to me sometimes as if there had been too much anxiety among certain veterinarians to increase and exaggerate such danger as there might be, not so much for the good of the public as because the more the people became panic-stricken, the greater the likelihood that their pocketbooks would be fattened.

On the other hand, it is only since the introduction of tuberculin that we have had any reason to hope that we

may finally be able to control the spread of tuberculosis among dairy cattle. Tuberculin has not only enabled us to rid many individual herds at least temporarily of tuberculosis, but it has greatly modified and changed the generally accepted opinion of tuberculosis.

It has enabled us to gain a truer insight into the mysteries of heredity, and it has shown more clearly the prevalence of tuberculosis.

Probably one of the most important of the new facts brought to our notice through the use of tuberculin, is a knowledge of the immense number of latent or undeveloped cases of tuberculosis that exist in every herd. It is startling to see a large number of autopsies made, and note what a large proportion show only very slight evidence of disease. In referring to this matter Bang says: "As soon as tuberculin inoculation was undertaken on a large scale the public was surprised at the very large number of reacting animals, even in herds of healthy appearance. I refer to the work as done first by Koepp in Dorpat, then by Siedamgrotzky and Eber in Saxony, Nocard in France, Malm in Norway and others."

The Danish investigations have yielded exactly similar results. Where tuberculosis exists it often has an extent which no one has suspected. The discovery produces at first a benumbing effect and is always very painful to the owner of dairy stock. Because of this it cannot be made too emphatic that there is a great difference between what was formerly termed tuberculosis and what, as a result of the tuberculin test, is now indicated by the same word. When a reacting animal is butchered, the butcher very often finds no trace of tuberculosis and the veterinarian must search carefully to discover the little knots on the lymph glands, frequently the only pathological signs.

These are, especially in the retro-pharyngeal, mesenteric, mediastinal and bronchial glands. The majority of reacting cows have simply latent tuberculosis. In time this may develop further in many cases. But my investigations have shown that such tuberculosis can often remain without development for years, and exert no influence on the general

health or the functions of the animal. We cannot conclude from this observation that an animal which reacts with tuberculin is thereby condemned to advancing disease, to wasting away and final death. The reaction simply indicates the possibility of such a result. Whether or not it will prove a reality, we do not know.

Prof. Theobald Smith in an address to the Harvard Medical Alumni notices the same thing when he says: "The need of a better education in animal pathology is well shown by the work undertaken in this country by public authority to restrict, suppress, or eradicate tuberculosis among cattle. Tuberculin produces a temporary fever in all infected animals whether they be in the earliest stage of the disease or in the most advanced stages. In fact the not infrequent absence of any lesion after a tuberculin reaction is explained by the statement that the focus or foci could not be detected. There are a large number of cattle slaughtered on the evidence furnished by tuberculin which are in the earliest stages of the disease. A small focus in a mediastinal gland, perhaps, or in one of the throat or mesenteric glands, is all that can be found.

"Pathology has informed us that traces of stationary or healed tuberculosis, unrecognized during life, are not infrequently encountered on the post-mortem table. Are such persons to be placed within the class of diseased or simply infected? I believe that an infected animal is not necessarily an affected or diseased animal, and that no one can predict just what is going to become of a primary focus, whether it gradually encroach upon neighboring organs or become generalized, or become calcified or cicatrized." (See p. 320 Boston Med. & Surg. Journal, Sept. 24, 1896.)

Practically the same thing was demonstrated by Pizzini who has reported "observation upon lymph glands of persons having died without showing any evidence of tuberculosis. In twelve out of thirty cases examined microscopically and by inoculation in guinea pigs tuberculosis was demonstrated, and the further fact shown that only those guinea pigs inoculated with bronchial glands showed any evidence of disease." (Annual of Med. Sciences.)



This is further corroborated by reported observations made at John Hopkins University and elsewhere, from the large number of autopsies made on people dying from causes other than consumption that show evidence of undiscovered or healed tuberculosis. From the number of cases in which this occurs it is evident that a larger number of people have consumption at one time or another during life and recover, than there are that die from this disease.

Such a state of affairs is significant and the only inference to be drawn, is that tuberculosis is far more prevalent among human beings than we have had any idea of, and in fact that practically the same conditions exist among people, that have been found, through the use of tuberculin, to exist in cattle, and if tuberculin were used as diagnostic agent among people, we would probably find that in a large number of cases individuals would react to the test that are at present considered healthy.

Under these circumstances we would repeat the question asked by Prof. Smith: "Shall all these people be considered diseased, or only infected?" We incline to the belief that there is a considerable difference between such *infected* people and those that are *affected* or *diseased*.

In this connection it may be of interest to glance for a moment at the statistics showing the reduction in the death rate from tuberculosis in Massachusetts. During the past forty-five years consumption has steadily, and uniformly decreased; the maximum and minimum death rates being 42.7 per ten thousand in 1853 and 22.7 in 1893.

In Glasgow, Scotland, the figures are almost exactly similar.

In the period 1860-64 phthisis reached its highest mortality, viz: 4,094 per million. In the period from 1890-94 it was 2,315 so that in twenty-five years consumption has been reduced forty-four per cent. in fatality without special treatment as an infectious disease.

Unfortunately phthisis is the only form of tuberculosis which has been throughout consistently classified by the registrar-general, as a cause of death.

Then the report goes on to say: "We are therefore shut up

to the twelve years 1883 to '94, for evidence of the movement of tuberculous diseases *other than phthisis*. Dividing them into two periods of six years we find that the death rate from 'phthisis' has fallen from 2,849 per million to 2,316 and from 'other tubercular diseases' from 1,090 per million to 884, in both cases nineteen per cent., a result which quite casts into the shade the improvement in Prussia and Saxony, quoted from Cornet which he puts down to the credit of special prophylaxis. Clearly then we are warranted in asserting that among infectious diseases, tuberculosis is the most amenable of all to general hygienic measures, that, in fact from these alone as good results are obtained as from hygienic measures, plus isolation, disinfection, etc., in the case of diseases popularly known as infectious. It is not implied that special measures directed against the infectivity might not have produced even better results; but in view of the difficulties in the way of special prophylaxis, it is to be contended that more is to be expected from hygiene." (Report Glasgow Board of Health.)

The special interest attaching to the reduced mortality from this disease in both Massachusetts and Glasgow seems to me to be due to the fact that these improved conditions have been attained entirely as a result of a better knowledge of the disease and a more strict carrying out of hygienic measures.

Such a retrospect is encouraging when one considers that similar results would follow the introduction of like measures when applied to dairy cattle, but before this can be done people must recognize the necessity for it, and the great room for improvement there really is.

Before considering in greater detail the control work that has been done in Massachusetts, let us turn for a moment to some of the other countries and states where such work has been attempted.

In European countries probably the laws in force in Denmark are best known. There for many years past owners have attempted to control tuberculosis by removing diseased animals and having the stalls and stables disinfected, and as Bang remarks, "These efforts were not with-

out significance. The conditions of health were improved, especially in places where the entire herd was subjected to thorough investigation by a competent veterinarian, and where the owner and veterinarian worked harmoniously together." "But even with these conditions it was hardly possible to be entirely freed from the disease." "The hidden latent cases always remained, and were continuously coming to the surface."

After the introduction of tuberculin, Bang conceived the idea of dividing the reacting animals from those that did not react, and when the reacting animals showed no physical evidence of disease they were used for breeding purposes and their progeny immediately separated and kept with the healthy lot. In this way a new, healthy herd was gradually built up, the state assisting by providing tuberculin and veterinary services free; animals showing physical evidence of disease were destroyed.

In Switzerland a somewhat similar plan has been adopted. There the state pays half the cost of test, and only entire herds can be tested. All cattle that react must be branded.

The French method is slightly different; there if an animal is found to be diseased, the state tests the entire herd, the owner having the option of keeping those that react for one year or slaughtering them immediately and receiving compensation from the state. All cattle coming into the country must also be tested.

The Government in the Dominion of Canada provides tuberculin free, this being done principally for educational purposes. It is also proposed to test herds in which disease is known to exist, and as in France, all cattle coming into the country must be tested.

In Ontario the Board of Agriculture have strongly advocated Bang's methods among the farmers. If the milk, they say, from the reacting cows is used for the calves it should be pasteurized.

They state that "It is advisable to fatten quickly the animals that give a reaction with tuberculin; but are apparently healthy, and sell them to the butcher, making calcula-

tions to get rid of all reacting animals in the course of eighteen months or two years."

They also state: "Up to the present time these tests for tuberculosis by means of tuberculin, have been carried on by experts, veterinarians, etc., but that is no reason why any intelligent man, who makes an effort to post himself as to the methods of keeping clean and using the various instruments, should not test his own herd from time to time."

In New York, New Jersey, New Hampshire, Maine, Vermont and Rhode Island, owners receive half valuation for cattle killed and found diseased, and full valuation if condemned and killed and found free from disease. Pennsylvania, Connecticut, Illinois, Indiana, and other states give limited appraised value. In most of these states tuberculin is used either at the owner's request, or in such herds as are known to be diseased. Connecticut relies almost entirely on physical examination.

In Pennsylvania, New Hampshire and Massachusetts experimental work is being conducted in various directions at the present time, and the results will be well worth noticing. In Massachusetts the principles are practically the same as in these other states. The state pays full value for diseased animals with a limit of \$60.00. All cattle coming into the state must be tested, and tuberculin may also be used as an aid to diagnosis on animals condemned on physical examination by a qualified veterinarian; and at the written request of owners, provided they agree in their turn to certain conditions prescribed by the Cattle Commissioners.

In Massachusetts the work of inspection has been, I think fairly successful; in considering it, I would divide it into divisions—first, as a factor in the protection of the public health; second, as a help to the farmers and stock owners in their endeavors to rid their herds of disease. It seems to me that these two points must be considered separately. Many facts must be considered and the matter must be looked at from many points of view before one can gain even a faint idea of the magnitude of the subject, and it seems to me that in view of the many interests involved,

since we cannot stamp it out by heroic measures, we should be content if we can make steady and substantial gain.

We have only to look back a very few years to the time when milk was sold and cattle were butchered without any kind of supervision whatever. At that time the meat from "coughers" and "bolognas" were placed on the market and milk was sold without any restriction so far as the health of the cow was concerned.

In 1876 (according to the report of the C. C. for 1895) an act was passed providing for the appointments of inspectors of provisions, and animals intended for slaughter. This was a permissive act, simply providing that the mayor and aldermen of cities and the selectmen of towns, may annually appoint one or more persons, who may inspect all provisions, and animals intended for slaughter. Under this act, which was taken advantage of by the cities and towns only slightly, it was found to be impossible to organize any systematic inspection of the herds of cattle in the state, and in 1892 the law was so amended as to provide that the same authorities "shall annually in the month of April appoint one or more persons to be inspectors of provisions, and of animals intended for slaughter or kept for the production of milk." Under this latter act, however, no penalty was provided for the failure of the cities and towns to make the appointments required by the act, and it was found necessary to again strengthen the law. Accordingly, in 1893 a penalty was provided for cities and towns failing to appoint inspectors as required by law, and further, the inspectors were, by this act and for the first time, brought under the partial control of the Cattle Commissioners, by giving the Board the right to make appointments where cities or towns failed to do so, and the power to remove incompetent inspectors.

This latter act was approved May 3, 1893, and immediately after its passage, this Board undertook to collect the names and addresses of the various inspectors; to instruct them in their duties, in so far as they related to the matter of the suppression of contagious diseases among the domestic animals; and to see that, so far as possible, animals

intended for slaughter or kept for the production of milk, were inspected as thoroughly as circumstances would permit.

The first attempt to collect the names and addresses of the various inspectors was begun on May 12, 1893. Up to about October 15, 1893, only about one-half of the cities and towns in the Commonwealth had complied with this requirement.

From this small beginning, and in the face of many discouragements, the organization of this corps of inspectors has been developed, until now (1895) all but four of the cities and towns in the Commonwealth have made the necessary appointments.

This was a long step in the right direction. The principle involved was right. It secured the inspection of each herd in the state, and as I shall endeavor to show later, it has resulted in an immense amount of good. Of course the system is by no means perfect, the local authorities, except in large towns, rarely appoint qualified men for the position. I hope, however, that before long instead of the local town inspector the State will be divided into districts, each district being in charge of an experienced, qualified veterinarian. In this way, the work will be done far more thoroughly and one of the principal objections to the present method will be done away with.

In referring to the work of the local inspectors one often hears the remark made, that physical examination does not amount to much any way! Now while I admit that many bad cases cannot be picked out by physical examination, yet I am also satisfied that a large proportion of the bad cases of tuberculosis can be picked out, and many more can be suspected so that they may be quarantined and tested. As a rule the bulk of cases of udder tuberculosis and a large proportion of generalized tuberculosis will usually show some suspicious symptom, and if these bad cases are got rid of, and if the milk supply is obtained from such animals as are in good general health and show no physical evidence of disease, the danger I believe, would be reduced to a minimum.

As showing the good that can be accomplished by a herd

to herd inspection, even by those who cannot be considered experts, I wish to call your attention to the following table; this refers to the work done by the local inspectors for the past three years and while the tables are not to be considered absolutely correct, especially in the year of 1895, yet I believe they give in a fairly accurate way at least the approximate number of bad, dangerous cases that have occurred in each year.

#### LOCAL INSPECTION.

##### *January 1st to December 31st, 1895.*

No. of animals tested.....	4,484
“ “ condemned and found diseased.....	2,398 or 53.4 per cent.
General tuberculosis.....	784 or 32.6 per cent.
Animals tested—no reaction—Per. to kill—P. M. lesions found.....	53

##### *January 1st to December 31st, 1896.*

No. of animals tested.....	7,062
“ “ condemned and found diseased.....	4,173 or 59.6 per cent.
General tuberculosis.....	1,051 or 25.1 per cent.
Animals tested—no reaction—Per. to kill—P. M. lesions found.....	82

##### *January 1st to June 30th, 1897.*

No. of animals tested.....	5,300
“ “ condemned and found diseased.....	3,016 or 56.9 per cent.
General tuberculosis.....	84 or 2.7 per cent.
Animals tested—no reaction—Per. to kill—P. M. lesions found .....	21

You will notice of course that the last year is incomplete; the table only takes up to the end of June, but in the time it includes the yearly inspection, which was carried on this year in the spring instead of the fall, and at the present time the great bulk of the work is over and only a very few cattle are being placed in quarantine by the local inspectors.

You will notice further that there were more animals quarantined this year than in 1895. In '95 out of 4,484 animals quarantined 53.4 per cent. were condemned and found diseased, and 32.6 per cent. had generalized tuberculosis. In 1896 7,062 animals were quarantined—59.6 per cent. were

condemned and found diseased, and 25.1 per cent. had generalized tuberculosis, an increase in the number of cases of tuberculosis and a considerable decrease in the cases of generalized tuberculosis from the previous year. This year 5,300 were quarantined—56.9 per cent. of these were condemned because of reaction, and were found diseased and only 2.7 per cent. had generalized tuberculosis. This means simply that the bad, dangerous cases have been got rid of to a great extent, and I believe by perfecting this system the conditions can be still further improved, and all danger to the public health from this source practically eliminated. It is, I know, an immense improvement over previously existing conditions.

But the work of the Board does not end here. The law says: (Sec. 45 of Chap. 491 of 1894, as amended by Sec. 10 of Chap. 496 of 1895.)

“When the board of cattle commissioners or any of its members, by an examination of a case of contagious disease among domestic animals, becomes satisfied that the public good requires it, such board of commissioners shall cause such animal or animals affected therewith, to be securely isolated, or shall cause it or them to be killed without appraisal or payment; provided, however, that whenever any cattle condemned as afflicted with the disease of tuberculosis are killed under the provisions of this section, the full value thereof at the time of condemnation, not exceeding the sum of sixty dollars for any one animal, shall be paid to the owner thereof out of the Treasury of the Commonwealth, if such animal has been owned within the State six months continuously prior to its being killed.”

There was nothing in this law to prevent an owner having his herd tested by private test, if he so desired. If the test was made by a regular veterinarian, the state could only accept it, appraise and destroy the cattle and grant the owner compensation.

This was an ideal method for both the unscrupulous owner and the veterinarian; by this method there were no restrictions placed on the owner, he could test as many or as few animals as he desired. Many times owners would have their



herds tested without any idea of attempting to keep them free from disease; when the reacting animals were destroyed others were bought without test and often placed in the same barn without any attempt at cleansing or disinfection. Such a method of doing business was neither common sense nor business-like; there was little use in the state paying for cattle that reacted to a private test, unless the owner really desired to clean up his herd and meant to stick to it once he began it. This is a point of a good deal of practical importance. The business man and the capitalist; the men who make a business gain out of the sale of milk from tuberculin tested cows; the men who run their own milk route, who have their own customers, and who get from two to three cents more per quart because of the test; such men naturally wish their cows tested, and would naturally keep it up as a business investment. Then again the men who raise their own stock, and who wish to get rid of disease for the sake of their own herds in which they are interested; they would also be likely to keep up the work in one way or another, for they think if we can only once get rid of the disease we stand a fair chance of keeping free from it. They have got an object in view; they aim at something definite.

On the other hand the dairyman who ships his milk to the contractor, who gets the contractor's price, who has the surplus question to deal with, who sells his cow when she runs dry, and buys fresh cows to replace the old, he has to buy frequently, and test every cow he buys and has to run chances at that. What encouragement has he to keep up the work? There is no profit in it for him; he has no increased price for his milk. There is simply added expense without increased gain.

Is it any wonder then that although he may be enthusiastic at first, yet after a time he loses interest, and finally through want of enthusiasm and want of encouragement, he is apt to become negligent and introduce cows into his herd that have not been tested, and this carelessness and indifference of course is liable at any time to undo any good that had already been done.

Realizing something of this and feeling that many of the

farmers, who had their herds tested by private test, did not recognize their responsibility in the matter, a letter was sent to each individual calling his attention to the law allowing him compensation "not exceeding the sum of \$60.00" for animals killed as tuberculous; provided, such person shall not have, prior thereto, in the judgment of the cattle commissioners, by *wilful act or neglect*, contributed to the spread of tuberculosis; but such decision on the part of the commissioners, shall not deprive the owner of the right of arbitration as hereinafter provided. The letter then continued: "If an owner does not thoroughly disinfect and cleanse his barn, or if after having had cattle taken and paid for by the State, he introduces untested animals into his herd, he has through his neglect, contributed to the spread of tuberculosis, and, therefore, under this section, forfeits his right to compensation for such tuberculous animals as may hereafter be found in his herd."

After having had their attention called to the matter, one would naturally suppose that farmers who had gone to the expense of having a private test made, costing them anywhere from \$10.00 to \$100.00 and over, would take interest enough in the matter to cleanse their barns, especially after being warned of the penalty of neglect, but on investigation, it was found to be the exception rather than the rule when any cleansing even of the simplest nature was done.

The Board then decided to send around a special agent whose duty it would be to call on each individual who had had his herd tested; see whether the barn had been attended to and report to the Board. This was done and this work has been specially productive of much good. Up to the end of August 530 barns, where private tests had been made, had been visited; out of these 530 barns, it was found that only forty-two had been cleansed and disinfected, and in 488 absolutely nothing had been done in the way of cleansing. Out of the 530 only ninety-five were respectably clean, and 435 were filthy. The usefulness of this work is well shown by the results following these visits.

By the end of August a second visit had been made on 158 barns where the owner had previously been found negligent.

Of these 158 barns visited the second time, 134 were found cleansed and disinfected and in only twenty-two had nothing been done. These twenty-two were all in a dirty condition, several of them being absolutely filthy. Such work as this is exceedingly important, not only because of the practical amount of good it does in removing infectious material from the barns; but in an educational way as well. This I believe is the key to the whole question and it is surely something that no intelligent man can reasonably object to.

During the early months of the year the testing of herds by private test, where the owner seemed to care for little except how to get a good appraisal for his cattle, became so frequent that in June the Legislature passed a law to the effect that "No person having animals tested with tuberculin shall be entitled to compensation from the treasury of the Commonwealth for any animals that react to the tuberculin test, unless such testing be done by the State Board of Cattle Commissioners, or their authorized agents acting as such at the time of the test, and such testing shall be subject to the supervision and control of the State Board of Cattle Commissioners." "This act shall take effect upon its passage. (Approved June 10, 1897.)" The immediate effect of this law was to shut off indiscriminate, irresponsible testing.

The State is willing to assist an owner to purge his herd from disease if the owner is in earnest, but before it will undertake to assist, it requires him to sign a written agreement that he will observe the sanitary regulations prescribed by the Board, and that he will not introduce any animals into his herd without first subjecting them to the tuberculin test. In this way herds are only tested where the owner is not only willing, but anxious to keep up the work and of course under these circumstances there is a much better prospect of the work resulting in permanent improvement.

But many times even when there is not only enthusiasm but unlimited capital behind the endeavor to rid a herd of disease, even then, it is not always an easy matter.

About eighteen months or two years ago a number of herds in Massachusetts were tested with tuberculin, under promise from the owners to observe certain conditions.

Among those tested was one belonging to Mr. H. consisting of eighty-one animals. This herd was carefully tested, and the figures submitted to the Board, and twenty-eight animals considered certainly diseased by the Board were condemned and destroyed, and a number were held for retest. The animals held for retest were kept in a separate pasture, and were not allowed to mingle with the rest of the herd. Of these, thirteen animals were retested, condemned by the Board and killed, the others passed as sound. Before these cattle were allowed to join the herd, an attempt was made to disinfect the barn as thoroughly as possible.

In October, 1896, sixteen months after the first test, the farm was again visited, and one lot of fifty head, kept in the new barn, were tested. These consisted of twenty-nine of the original lot; of the others eighteen were Vermont cattle, and all had been tested carefully before being shipped, especial pains being taken to secure only healthy animals. Three others, not tested, were introduced into the herd on or about September 30, and at that Mr. H. notified the Board and it was expected that the entire herd would be retested immediately. However, because of the difficulty in securing sufficient tuberculin, a delay of a few weeks occurred, and it was not until October that two members of the Board visited the herd and tested the lot. Of the fifty animals tested, twenty-seven reacted, were condemned and killed, twenty-five of which proved to be tuberculosis upon post mortem examination.

About two months later the remaining twenty-eight animals in the old barn which had been kept entirely separate, were tested and sixteen gave well marked reactions. The barns were disinfected and the sixteen cows, being mostly dry cows and springers, were isolated on one side of the barn, two partitions being placed between them and the other cattle. They stayed here until March 5th, when they were again tested and at this time they gave fourteen well marked reactions. The temperature of the other two cows at the second test read as follows:

- No. 129. 1st test. Jan. 8th, 101, Jan. 9, 101, 104.4, 103.4, 103.2.  
2nd test. Mar. 5, 101, Mar. 6, 101.3, 101.3, 101.3, 102, 99.4.  
No. 5468. 1st test. Jan. 8, 101.3, Jan. 9, 104, 105, 105.1, 104.4.  
2nd test. Mar. 5, 101, Mar. 6, 101.4, 101.4, 102.2, 102.2,  
102.2.

Both were killed and on post mortem examination proved to be diseased. The barns were again disinfected with bichloride of mercury 1-800 and whitewashed later.

On the 1st of May, 1897, the entire herd of eighty-four head were again tested and this time fifteen animals or seventeen per cent. gave reactions, and were killed. The post mortem examination showed these animals to have been only very slightly diseased.

The barns have been twice disinfected during the summer, and another test will probably be made in October. After every test when cattle have been condemned the herd has invariably been replenished with tested cows from Vermont.

A second herd belonging to Mr. E. is another good illustration of the difficulty in thoroughly disinfecting barns. After being first tested and cleaned up in October, 1894, this herd was retested on March 17th and 18th, 1896. There were eighty animals in the herd, seventy-eight of which were tested, two animals having a temperature too high at the time to be injected. Fourteen animals reacted or showed a suspicious rise in temperature; they were immediately separated from the remainder of the herd, were again retested June 19th and 20th, at which time two were released, three were condemned and nine were continued in quarantine. On October 7th, 8th and 9th these nine quarantined animals were tested and condemned.

On August 16th and 17th, 1896, sixty-four of the original herd and one animal which had been introduced recently were tested. None of the original animals reacted to the test, while the animal which had been introduced from outside reacted and was condemned, and upon post mortem was found to be tuberculous.

In the meantime a new barn had been built, and was used as the home barn; the old barns was disinfected as thoroughly as possible and the young stock and the dry

cows were housed in them, the fresh cows being brought to the new barn as they came in.

In the month of August, 1897, exactly one year after the previous test, the herd was again tested. At this time there were 154 animals at the home farm. These were all tested; twenty-two were condemned and killed as tuberculous and thirty-two were released. Five out of fifty-four at the second farm were condemned, and one out of fifty-eight at the third farm was also condemned. All these cows were found to be diseased, the disease being very slight and confined entirely to the bronchial and mediastinal glands.

It is but fair to state that another of the reacting animals was a registered bull, "Sir Michael." He had been kept isolated from the rest of the herd except when being used for service, since March, 1896, when he first reacted. At that time the temperatures were:

8 P. M., 101. 6 A. M., 101, 101.2, 103.4, 104.4, 104.3, 104.2, 104.3, 104.2, 103.

On June 13th, 1896.

9:30 P. M., 101.1. 7:30 A. M., 102.3, 103.1, 103.1, 103, 103, 101.3.

On August 18th, 1896.

7:00 P. M., 101.2. 5:00 A. M., 101.1, 101, 102.2, 103.4, 104, 103.4, 103.4.

And on August 10, 1897.

8:00 P. M., 101, 101.1. 7:00 A. M., 101.2, 103.1, 104.3, 105.

This bull had been used for service on nine cows out of the twenty-two that have since reacted and were killed; one of the cows had been served as recently as July 21st, 1897, or just about four weeks before the last test was made.

The fact that none of the cows showed any traces of tuberculosis except in the bronchial and mediastinal glands would seem to exclude the bull as a possible source of infection so far as sexual intercourse was concerned, in any of these cases.

In studying the problem of State control, I should like to call your attention to the principles of sanitary science as applied in the United States and European countries, to the suppression and prevention of contagious disease.

A few years ago, at the time of the latest cholera scare, the seaports of this country were all guarded and a strict quarantine of all vessels coming to this country from infected ports, was enforced. Most European countries took the same precaution. Great Britain, however, proved an exception to the rule. Her ports were open to the world, vessels of all nationalities went in and out and tourists and travelers from all countries had the right to go and come as they pleased. Great Britain relied on the excellence of her internal sanitary arrangements to combat the disease. If she had placed all vessels from infected ports in quarantine, the loss to the country would have been tremendous. The traffic between Great Britain and other countries was too great and the number of vessels entering her ports from infected countries were too numerous to permit of it. The disturbance to traffic would have been enormous, and in the opinion of the authorities the gain would not have been commensurate with the probable loss; other means, therefore, had to be relied on to control and check the spread of the disease.

In the same way the difficulties in the way of the total and permanent exclusion of the tubercle bacillus are too great to permit of our relying on these means alone; we must not only attempt to control the breeding places of the bacillus and lessen the number that are mixed with the dust in the infected premises, but we must look to the perfecting of internal sanitary arrangements so that individuals may not become such easy victims of the disease, and by using all the means in our power and by constant and continual effort the existing conditions may be bettered, so that in time we may reach some measure of success, without the great expense involved in the total destruction of all animals that react to the test.

In Massachusetts during the year 1895, there were 1,549 cattle tested by private request, representing 109 entire herds. Of this number 433, or 27.95 per cent. were condemned. In 1896 there were 2,021 cows tested by private request representing 281 entire herds; of this number 1,098, or 54.32 per cent. were condemned. This year up to July full returns had been received from 1,810 cows, representing

153 entire herds; of this number 911, or 52.54 per cent., were condemned. This percentage includes four herds recently cleaned up in the western part of the state. These four herds include ninety-six animals, only three reacting, making a percentage of 3.1. It will be interesting to see how these tests stand a year from now.

This work is different from the work of the local inspection, in that the inspectors only pick out such animals as show some physical evidence of disease, while this work represents the testing of entire herds scattered at haphazard over the Commonwealth. If this is taken then as any sort of guide to the number of diseased cows in the State, then there are roughly over half of the milk cows in the State that would react to tuberculin.

During the present year the average price actually paid for cattle condemned for tuberculosis, has been \$35.80 per animal. The number of neat cattle over one year old assessed in the Commonwealth in 1896, was 212,601, and probably about 172,000 of these were milk cows. It does not require much calculation then to find out that if all cows were tested and all those reacting were killed off, it would cost the State about three and one-half million dollars to pay for the cows killed, not to mention the cost of the executive portion of the work. The authorities in Pennsylvania and elsewhere have placed themselves on record as being of the opinion that from the enormous cost of the work, the testing of every cow in their various districts is impractical. Massachusetts is of the same opinion. She believes that the danger to man from Bovine Tuberculosis can be lessened by the adoption of broader methods in control work. For example, I believe that the entire work would be benefited both as to expedition and thoroughness if the State was divided up into veterinary districts; each district in charge of an experienced, qualified veterinarian who would be responsible to the Commission for his district. He would be responsible for the supervision of herds in his district, and he would be responsible for the slaughter houses established by the State or city in his district.

It is time I believe that the country slaughter house was



done away with. It is time the State took the matter up, and I believe an opportune moment for the change has come. Greater economy must be used in the disposal of carcasses of animals that react to the test, especially as over ninety per cent. of the animals condemned seem to have only localized tuberculosis.

I believe that State slaughter houses could be established; that stalls in these slaughter houses could be rented to local parties. This would greatly simplify the inspection service, and the dirty, filthy country slaughter house would have to go; and there would be this further advantage, that in State or municipal slaughter houses under a proper system of inspection, much of the meat at present condemned to the rendering tank, could safely be used for food. This is a matter that I hope to see taken up and acted on at an early date.

#### MUNICIPAL CONTROL OF TUBERCULOSIS,

BY E. P. NILES.

MR. PRESIDENT AND GENTLEMEN: The task of controlling tuberculosis by municipal government is no small one; yet it appears to me that here is just where the work should be begun. If we endeavor to control tuberculosis by national or state legislation we at once find a hopeless task, because legislators will never support us as thoroughly as we would wish for, as long as the laity is opposing us with such great forces as at present. By beginning with municipal governments we educate the people by degrees to the importance of controlling this dreaded disease; and each municipal precinct controlling it within its own limits, acts as an entering wedge in the education of the public at large.

In order to effectually control tuberculosis, and eventually stamp out the disease we must at the same time look to its control in the human family. If we are to benefit mankind, other than financially, what good is there in making laws for the control of the disease in the lower animals and at the same time allow tuberculous people to care for such animals and expectorate their tuberculous sputa wherever they

choose? The work of controlling tuberculosis should, and must to be effectual, begin with the human family simultaneously with the lower animals. Not long ago the City of New York made a move to control the disease in the human family in that city. This is a good move so far as it goes; but, do they have there sufficient legislation to effectually control the disease in the lower animals of their vicinity? Do they have a proper meat and dairy inspection, and sufficient means to prevent the spread of the disease in all classes of animals, as well as in man? I fear not.

There are many difficulties to be overcome in dealing with this question, both to municipal and state governments. The most serious difficulty in controlling the disease in the lower animals is the proper, and at the same time the most profitable, disposition of the condemned animal. The stock owner will not acquiesce to any movement to exterminate the disease in his herd unless he is compensated for the condemned animals. The dairyman who supplies milk to a city will not consent to dairy inspection unless he is compensated for his condemned cows, or receives a much greater price for his milk. The consumers of milk, being ignorant, skeptical, or slow to comprehend the importance of a pure milk supply, refuse to pay an advanced price. Municipal governments are usually bankrupt, and therefore lack the funds to employ a dairy and meat inspector, much less to compensate the owner for his condemned animal. City boards of health are endowed with a very limited fund, and as a rule composed entirely of medical men who do not realize the importance of controlling the disease among the lower animals in their vicinity. Members of many such boards can not even be convinced that the disease is infectious. Municipal officers must, therefore, first be educated before much can be done in the way of controlling the disease in municipal precincts.

I believe, however, that we should begin with municipal governments first, then with state, and lastly with the national. City boards of health should be empowered to establish and maintain such rules and regulations as are necessary for the control of the disease in man, and the lower animals which supply their city with dairy products.

They should have as a member of their board a qualified veterinarian, at a fixed salary, whose duty it should be to inspect all dairies supplying milk to, as well as all meats sold in, the city. This would naturally lead up to state control, the state co-operating with the cities; from this to national control, each state co-operating with the National Government. Compensation should be alike in all states. The work should begin in the dairy and breeding herds, and from these extend to private herds.

Until some such plan as this can be adopted the work of controlling tuberculosis will progress slowly and unsatisfactorily.

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## TUBERCULIN.

### THE ACTION OF TUBERCULIN UPON NON-TUBERCULOUS COWS, ITS INFLUENCE UPON THE PRODUCTION OF MILK AS REGARDS QUANTITY AND QUALITY.

BY T. D. HINEBAUCH.

My connection with the North Dakota Agricultural College and Experiment Station since 1890, afforded me excellent opportunities for observing conditions as they would arise or change during the formation of a dairy herd.

As the college acquired cattle by purchase or donation, they were tested with tuberculin, to determine whether or not they were affected with tuberculosis. Out of the total number thus purchased, two were found to have tuberculosis, and one other, bred from one of these tuberculous animals after she was put into the herd, also developed the disease. As constant additions were made to the herd, it became necessary to make a goodly number of tests. We did not always confine our tests to animals purchased, and in many instances we retested. In this way some animals were tested three or four times during a period of two or three years. The reading of dairy literature brought up questions, the settling of which seemed to have a direct

bearing upon our work as an experimenter, and for that reason we determined to collect accurate data, and to determine if possible whether the effect of tuberculin was deleterious to the health of the animal or to its ability to produce the products which are expected from dairy cows. Our first test for this purpose was made in January, 1896, but the conditions before and after the test were of such a nature that it was almost impossible to place any confidence in the results. The milk was accurately weighed and tested as to the amount of butter fat for eleven milkings preceding the injection and for the same number of milkings succeeding the injection. From the time the test was commenced until it was finished, during the eleven days, there was a range of temperature from eighteen degrees above to thirty-two degrees below zero. Animals not tested showed a considerable change in the amount of milk, due to the change in temperature. Twelve animals in all were tested. Of that number eleven lost seventy-nine pounds of milk during eleven milkings succeeding the injection, and one animal gained 7.5 pounds. The loss in individual cows varied from 2.75 to twenty pounds. Eight of the animals gained in the per cent. of butter fat contained in the milk, the gain varying from .0242 to .2106. Four animals showed a loss in the per cent. of butter fat, varying from .021 to .128. Three cows gained in the total amount of butter fat, while nine cows made a loss in the total amount of butter fat. The total amount of butter fat gained was 1.0087 pounds, and the total amount lost was 2.1525 pounds. Making a comparison of this gain or loss with other animals that were not tested, we find that it is somewhat similar, and believe that the loss in the second period, at least a portion of it, was due to the cold weather.

In order to avoid errors which are necessarily present when periods are short, I determined to extend the experiment. I have not worked the experiments up during the whole period, but have completed them from the 16th of June, to November 1st, 1896. The experiments after November 1st are not of much value, as a good many of the cows in the experiment were dry. The temperature of the animals

was taken the morning of the day the injection was made, also just preceding the injection, and at three other periods as indicated by the table. The amounts of milk as produced by each cow before and after injecting the tuberculin, are as follows, the temperature being given in the first table.

TABLE I.  
BEFORE TESTING. 11 MILKINGS.

Name of cow.	Lbs. of milk.	Lbs butter	Ave. lbs. milk.	Ave. per cent. butter fat.
Pollie.....	92.25	3.7245	8.4	4.026
Jennie.....	147.5	4.881	13.4	3.309
Aggie.....	85.	4.2905	7.72	5.047
Ella.....	198.	5.849	18.	2.9529
Lucy.....	169.75	4.056	15.4	3.562
Hilda.....	94.5	4.451	8.59	4.71
Mollie.....	54.5	1.899	4.9	3.469
Pet.....	84.75	4.732	7.7	5.584
Clara.....	94.25	3.535	8.56	3.7517
Daisy.....	36.5	2.2265	3.3	6.1
Vina.....	237.5	8.1505	21.6	3.4317
Anna.....	86.	2.9375	7.8	3.4156
Totals.....				

TABLE II.  
AFTER TESTING. 11 MILKINGS.

Name of Cow.	Milk.	Butter Fat.	Average Milk.	Butter fat percent.	Gain or loss in milk.	Gain per cent or loss in butterfat	lbs butter fat, gain or loss.
Pollie.....	85	3.3135	7.7	3.898	*7.25	*.128	†.1785
Jennie.....	139	4.72125	12.6	33.97	*8.5	†.088	*.1597
Aggie.....	82.25	4.220	7.47	5.138	*2.75	†.091	*.0645
Ella.....	192	6.074	17.45	3.1635	*6.	†.2106	*.373
Lucy.....	149.25	5.47625	13.66	3.669	*20.5	†.107	†.4202
Hilda.....	90.75	4.333	8.25	4.772	*3.75	†.062	*.128
Mollie.....	49.75	1.78905	4.5	3.59	*4.75	†.121	*.113
Pet.....	81	4.5065	7.36	5.563	*3.75	*.021	*.226
Clara.....	85	3.1565	7.7	3.725	*9.25	†.0317	*.379
Daisy.....	29.25	1.7625	3.66	6.06	*.725	*.04	*.464
Vina.....	245	8.585	22.2	3.4959	†7.5	†.0242	†.415
Anna.....	80.75	2.68825	7.3	3.3291	*5.25	*.0875	*.2473
Totals.....							

\* Loss. † Gain.

TABLE III.  
INJECTED JUNE 30th, 1896, 4:30 P. M.

NAME.	7 A. M.	4:30 P. M.	5 A. M.	7 A. M.	9 A. M.
Hilda.....	101.4	101.2	100.6	101.4	101.6
Nellie.....	100.8	102.2	101.2	101.6	102.
Anna.....	101.2	102.	102.8	102.	102.
Mollie.....	101.8	101.	100.4	101.	101.4
Kate.....	101.4	102.	101.2	102.	101.2
Lucy.....	101.	101.8	102.	102.	102.4
Pet.....	101.4	100.8	100.	101.8	102.
Vina.....	101.4	102.3	102.2	102.2	102.4

TABLE III—CONTINUED.

NOT INJECTED.

NAME.	7 A. M.	4:30 P. M.	5 A. M.	7 A. M.	9 A. M.
Clara.....	101.5	108.	101.6	101.6	101.8
Ella.....	101.2	102.	100.2	101.4	101.8
Aggie.....	100.4	108.	101.6	101.6	101.4
Marie.....	101.4	102.	102.6	101.4	102.2
Hazel.....	101.6	101.2	101.2	101.	102.
Pollie.....	101.	104.4	102.6	103.4	103.
Jennie.....	101.8	102.8	102.6	101.	102.
Hereford, P. B.....	101.	102.4	105.4	105.4	106.

TABLE IV.

INJECTED JULY 30th, 1895, 4:30 P. M.

NAME.	7 A. M.	4:30 P. M.	5 A. M.	7 A. M.	9 A. M.
Hilda.....	101.8	100.4	99.6	100	100.2
Nellie.....	101.4	101.2	100	101.4	101.2
Anna.....	102	101	100.4	101.6	101.8
Mollie.....	100.6	100.4	99.4	100.2	101
Kate.....	101.2	101.4	101.4	101.4	101.6
Lucy.....	102	101.2	99	101	101
Pet.....	100.8	99.6	100	101	100.8
Vina.....	101	101.6	100.6	101.2	101.4
Hereford, P. B.....	101	101	101	101	100

NOT INJECTED.

Clara.....	102	100.2	100.6	101.8	101.4
Ella.....	101	101	99	101.2	101.4
Aggie.....	101	100.2	99.8	101.4	101.2
Marie.....	101.8	102.2	101.2	101.8	101.2
Hazel.....	101	100.4	101.4	101.4	101.6
Pollie.....	101.4	102	101	101	101.4
Jennie.....	101	101	100.8	101.8	102

TABLE V.

INJECTED AUG. 28th, 1896. 4:30 P. M.

Hilda.....	102.4	103.6	102.6	100.6	100.8
Nellie.....	102.8	103.8	100.2	101.4	101.6
Anna.....	102.6	103.2	101.	100.4	101.
Mollie.....	102.	103.2	100.	101.2	101.
Kate.....	102.	103.2	101.	101.	101.2
Lucy.....	102.8	103.2	102.2	100.4	101.
Pet.....	102.4	102.4	100.	101.	101.
Vina.....	102.6	103.8	100.	101.	101.4

NOT INJECTED.

Clara.....	102.4	103.8	102.8	102.8	100.
Ella.....	101.6	102.	101.	100.	100.
Aggie.....	102.	102.4	102.	101.	101.
Marie.....	102.6	103.2	101.2	101.4	101.
Hazel.....	101.8	103.2	99.8	100.	100.
Pollie.....	102.2	103.1	101.8	100.2	100.8
Jennie.....	102.8	102.8	101.	101.	101.2

## INJECTED.

NAME.	7 A. M.	4:30 P. M.	5 A. M.	7 A. M.	9 A. M.
Hereford P. B.....	102.8	102.	104.8	104.	102.2

TABLE VI.

INJECTED OCT. 7th, 1896, 4:30 P. M.

NAME.	7 A. M.	4:30 P. M.	5 A. M.	7 A. M.	9 A. M.
Hilda.....	99.6	101.6	100.8	100.8	101.
Nellie.....	101.	99.8	101.	101.	101.4
Anna.....	102.	101.	102.	101.	101.4
Mollie.....	100.8	101.	100.	101.	101.2
Kate.....	101.2	101.4	100.4	101.	101.4
Lucy.....	101.	100.4	101.2	102.	101.8
Pet.....	101.4	100.	100.8	101.6	101.2
Vina.....	102.2	100.6	102.	102.	101.8

## NOT INJECTED.

Clara.....	101.4	101.	101.	101.8	101.4
Ella.....	101.8	100.2	101.	100.6	101.6
Aggie.....	101.6	101.2	101.2	101.	101.2
Marie.....	102.2	100.8	100.4	101.	100.8
Hazel.....	100.6	100.	100.6	100.8	101.4
Pollie.....	100.8	100.6	100.	100.6	101.
Jennie.....	101.	100.8	101.	101.8	101.6

## INJECTED.

Hereford P. B.....	100.	100.4	100.2	100.2	102.4
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TABLE VII.

BEFORE INJECTING WITH  $\frac{1}{4}$  c. c. CONCENTRATED TUBERCULIN.

NAME.	No.	Milk, Lbs.	Butter fat, Lbs.	NAME.	No.	Milk, Lbs.	Butter fat, Lbs.
Hilda.....	1	286.50	10.81275	Vina.....	1	477.75	17.41175
	8	177.25	8.81255		8	480.75	14.42175
	5	208.75	8.99675		5	446.75	14.80725
	7	254.50	10.69		7	644.50	24.11875
Kate.....	1	427.5	17.05625	Lucy.....	1	353.75	14.86275
	8	412.50	15.08625		8	298.	12.6095
	5	408.	15.88825		5	281.50	13.89825
	7	535.75	20.97325		7	380.	20.1545
Mollie.....	1	374.50	10.82	Pet.....	1	226.25	12.1725
	8	282.	10.165		8	186.25	9.32675
	5	269.75	9.81175		5	186.75	10.71660
	7	451.75	16.0805		7	270.	16.41175

TABLE VIII.  
AFTER INJECTING WITH TUBERCULIN.

Name.	No.	Milk, lbs.	Butter Fat, lbs.	Name.	No.	Milk, lbs.	Butter Fat, lbs.
Hilda .....	2	259.25	10.80975	Vina.....	2	454.25	15.15625
	4	163	7.844		4	421.25	14.06075
	6	175.50	8.239		6	498.50	14.29925
	8	201.50	9.411		8	676.50	22.96425
Kate.....	2	425.25	15.139	Lucy.....	2	309.25	14.3445
	4	407.50	14.615		4	275.50	12.58745
	6	382.75	14.75625		6	267.25	13.896
	8	446.25	16.8825		8	264.75	14.009
Mollie .....	2	277.25	10.108	Pet.....	2	204.50	10.9275
	4	282.75	9.79825		4	189.50	10.52
	6	257.75	10.24		6	181.75	10.92675
	8	372	13.846		8	223	13.32875

TABLE IX.  
NOT INJECTED WITH TUBERCULIN, BUT PERIODS SAME AS THOSE OF TABLE VIII AFTER INJECTION WITH TUBERCULIN.

Name.	No.	Milk, lbs.	Butter Fat, lbs.	Name.	No.	Milk, lbs.	Butter Fat, lbs.
Marie.....	1	462	19.239	Hazel.....	1	366.50	15.083
	3	445.25	16.50025		3	344.75	11.81475
	5	468.75	17.664		5	316.50	12.08775
	7	611.75	22.1085		7	403.75	14.28175
Pollie.....	1	174.25	7.97875	Jenny.....	1	375	14.33375
	3	181.75	7.96825		3	293.50	10.86275
	5	168.50	7.91575		5	537.75	13.51275
	7	230.75	10.64575		7	438.50	19.06025
Aggie.....	1	263.25	11.4805	Clara.....	1	129	55.282
	3	241.25	13.12905		3	142.50	5.8167
	5	229.5	11.37225				
	7	339.25	17.66125				

TABLE X.  
NOT INJECTED, BUT PERIODS SAME AS THOSE TABLE VII. AFTER INJECTION WITH TUBERCULIN.

Name.	No.	Milk, lbs.	Butter fat, lbs.	Name.	No.	Milk, lbs.	Butter fat, lbs.
Marie.....	2	447.50	16.26225	Hazel.....	2	368.	13.07025
	4	457.25	16.88025		4	298.	11.0055
	6	371.	14.32375		6	310.	11.698
	8	587.	21.461		8	268.50	10.8455
Polly .....	2	169.	7.6959	Jennie.....	2	347.25	11.926
	4	163.50	7.489		4	301.75	11.44185
	6	193.25	9.9405		6	309.	12.69025
	8	160.	7.7185		8	418.50	17.45985
Aggie.....	2	234.	11.78625	Clara.....	2	144.50	5.3624
	4	240.50	11.3655		4	160.	5.629
	6	209.25	10.74625				
	8	287.75	15.10175				

Taking the total amount of milk, (7,326.75 pounds) given by the cows Hilda, Kate, Mollie, Vina and Lucy before the period of injection, and comparing it with the same period after injection, total yield being 6795 pounds, we notice a



loss of 567.75 pounds, or 7.7 per cent. The total amount of butter fat of the same cows for the same period before injecting was 285.3678 pounds, and for the corresponding period after they had been injected with tuberculin, was 262.59862 pounds. This would give us a loss of 22.7816 pounds butter fat, or a loss of 7.9 per cent. Making a similar calculation of the cows Marie, Pollie, Aggie, Hazel and Jennie, which were not injected, we find that for the period corresponding to the period before injection of the other lot, the total amount of milk was 6,937.50 pounds, and for the period corresponding to that after those were injected, there is a total milk yield of 6,141 pounds, showing a net loss of 796.5 pounds, or 11.4 per cent. Corresponding periods showed 274.45 pounds of butter fat previous to the time of injecting, and 250.42 pounds for a corresponding period succeeding the injection, thus making a net loss of 24.03 pounds butter fat or 8.7 per cent.

To recapitulate; comparing the period before injection, we find that there was a loss of 7.7 per cent. in the amount of milk in those that were injected and 11.4 per cent. by those that were not. Those that were injected showed after the period of injection a loss of 7.9 per cent of the total amount of butter fat, while those that were not injected showed a loss of 8.7 per cent. butter fat.

**TUBERCULIN.** The tuberculin used in this experiment was secured from the Pasteur Anthrax and Vaccine Co., through their agent, Mr. Harold Sorby, of Chicago. We secured the concentrated material, and then diluted it as we wished to use it. In all cases before using the tuberculin, it was prepared and used upon animals, which we had every reason to believe were tuberculous. These animals always showed a reaction to the test, thus showing the tuberculin possessed its strength.

The Hereford cow mentioned in the experiment was injected regularly when the other cows were. One peculiar feature in connection with her temperature was that it did not become elevated at successive injections, but that two months had to elapse before the injection produced the

elevation of temperature, which is present when results are satisfactory.

**SELECTION OF COWS FOR EXPERIMENTAL PURPOSES.** Prof. Kaufman, who has charge of the dairy herd with myself, went over the records of these cattle for two years previous to the experiment. We selected the animals with regard to their record, taking the best animal and putting it into the division which were not to be injected. The second best animal was to be injected, the third best animal not injected, the fourth best injected, alternating until we had the desired number of cows. In this way we were pretty sure to get a fair representation, not giving either side the advantage.

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#### EXTEMPORANEOUS DISCUSSION.

Dr. Pearson: In dealing with the question of tuberculosis of cattle, and, in fact, with all infectious diseases of animals and all sanitary questions, the methods employed may be divided into two general classes: those that rest upon compulsion and force and those that rest upon persuasion and education. In Pennsylvania, in dealing with tuberculosis in cattle we have attempted the latter method, and are trying to educate our public and stockowners to the desirability of controlling this disease in a satisfactory manner and persuading them that it is right and proper for them to do so. I think we are justified in being encouraged by our results to continue in the same manner and not attempt force measures as are essential in dealing with some diseases. Tuberculosis is so widespread, it touches so many interests, it involves such a vast number of people, that it is very easy to develop a great volume of popular sentiment against any question that has to do with this matter, and all our work will, in that way, be defeated. That is one point to be considered, and another is the matter of expense. If we attempt force it will not be just to exercise it in one place and not in another. If we compel one farmer to have his cattle tested with tuberculin, it is unfair not to have all farmers have their cattle tested with tuberculin. We thus run up the expense to such

enormous proportions that the legislatures become frightened and the work stops. I had the pleasure of making a brief, preliminary report on the work that was going on in Pennsylvania, at the last meeting in Buffalo, and to that I may add that during the last year over ten thousand cattle have been tested with tuberculin, and about two thousand have reacted and have been killed. The expense in this work has amounted to about \$60,000. We paid for cattle to the extent of \$25.00 for unregistered animals and \$50.00 for registered animals. One of the characteristics of the work, the point in which it differs from the work in most other states is that herds are tested only at the written request of the owner. Now that may seem somewhat anomalous and I know some of you will be inclined to ridicule a system that is based upon principles of that kind, but it has worked satisfactorily and I think we are justified in continuing on the same line. In applying for the inspection the owner of the herd is required to fill out a regularly printed form and this printed form is, in effect, a contract by which he agrees to do certain things on condition that the state will make an examination of his herd and will pay him for the cattle there found to be tuberculous. The owner agrees to dispose of his cattle in the manner recommended by the State Live Stock Sanitary Board; he agrees to thoroughly disinfect his premises and agrees to do all in his power to keep his herd free from infection in the future, and that means that he must re-disinfect his premises and that the cattle must be re-inspected at his own expense as often as demanded by the Board.

Now, while it is true that inspections are only made by this Board on the request of the owner, there is a round-about way by the means of which owners are sometimes led to apply for inspection. For instance some cities have made regulations through their Boards of Health, providing that milk cannot be sold except from herds that have been tested. Some wholesale milk dealers arrange to purchase milk and cream only from herds that have been tested with tuberculin, and they find that it helps their business. Other large dealers are taking the system up and it is spreading rapidly.

The Live Stock Sanitary Board has full authority to quarantine in doubtful cases, and if it is reported by the Board of Health that a certain herd is infected with tuberculosis to a dangerous degree and that its milk goes on the market, the sale of the product of the herd is prevented, and then in order to escape from this condition the owner of the herd will apply for inspection voluntarily.

One of the principal difficulties that is met with in all work of this character is in reference to the expense. If we follow the work out on the same plan, and if it grows at the present rate, will require a very much larger sum next year. The principal expense is in paying for the cattle condemned as tuberculous. I should say, when cattle are condemned as tuberculous, they are killed in rendering establishments, slaughter houses or on the farms, and in all cases the carcass of a condemned animal is a total loss. Now, I feel, and I think that most of us will agree, that this is a serious loss, and really not only unnecessary but almost unpardonable, but, at the same time, the condition of public sentiment is such that it is difficult for the state to purchase an animal that is admitted as diseased and then sell the carcasses of that animal to the public. It is difficult to do that. It is difficult to educate the public to a point where that would be allowed. Now, is it true that the flesh of a tuberculous animal is dangerous as an article of food? This question has been sifted and has been investigated so thoroughly that I shall not go into it, because of course you are all well informed in reference to it; but at the same time, I might call your attention to the fact that the tendency now is to regard this meat with greater leniency than heretofore, and investigation has recently shown that it is not as dangerous as an article of food as was formerly thought; but at the same time it is now very firmly established, more than ever before, that in certain cases, the flesh of tuberculous animals is dangerous; that it does contain the living disease germ and that it will produce tuberculosis. So while it is perfectly safe to allow certain carcasses to go on the market, it is undeniably unsafe to allow other carcasses to go on the market. So an inspection is absolutely essential, and it

seems to me that Dr. Parker has hit upon the keynote of the situation when he recommended the establishment of public abattoirs, public slaughter houses owned and controlled by the state or by the municipal governments, wherein all cattle and in fact all animals to be slaughtered for food shall be examined both before and after slaughter by experts, and if their flesh is not safe as an article of food it shall be condemned, and if it is safe, it shall be allowed to go on the market. If that system could be established and the public could be gotten into the way of abiding by the decisions made under these conditions, it would be very easy indeed for the animals condemned by the state to be sent to these places, killed, examined, and their carcasses destroyed or sold according to the judgment of the inspector. I had thought, when I intended to prepare a paper on this matter, to go into the subject of the examination of carcasses of tuberculous animals in detail, and study the matter in all its bearings in order to ascertain what carcasses can be used, but the program is so crowded and my own plan in relation to the paper is so changed, that I think it is sufficient to say that in Germany, where this question has been studied most thoroughly, the generally accepted method is to release without restrictions of any kind, the carcasses of animals or cattle in which tuberculosis is found in a single organ, or in a single group of organs, provided the carcass or animal is without emaciation; whereas if the disease is more extensive, if it has passed beyond a single group of organs, if it shows a tendency to generalization, it is sold as tuberculous meat, thereby warning the purchaser to cook it thoroughly, or it is sterilized in a steamed sterilizer and then sold as cooked meat, while if the disease is more advanced, the carcass is sold outright and only used for technical, not for food purposes. I think that the agitation on this subject is well worthy the earnest efforts of this Association; and I believe that a great deal can be accomplished by this Association by bringing these matters before the public in a proper light. It has already been brought forward by Dr. Salmon in a number of instances. He discussed this matter in Pennsylvania some three years ago and advocated the use of flesh

of certain tuberculous animals, or those tuberculous to a certain degree, but it has not been taken up to a large extent; it is not a live subject; that is, it has not been given life by a sufficient discussion and very little change is being made in public sentiment in regard to it. As soon as we can establish a system of this kind it will be possible to control tuberculosis at less expense, and then of course, we can make far greater progress.

The third point for discussion in the printed program has reference to the disposition of tuberculous cattle. I have already referred to the disposition of the carcasses of tuberculous cattle. Now as to the disposition of the cattle themselves. While there is here but little difference of opinion, or, at all events, little difference in practice, you will find that by comparing home methods with those of other countries that great differences exist. You are all familiar with the work of Prof. Bang, in Denmark; you all know that there, instead of destroying animals, after applying the tuberculin test, they are allowed to remain alive, they are allowed to continue work in the dairy, but they are kept in separate buildings, or apartments, and are, if possible, cared for by separate attendants. The offspring are reared, but they are taken away from their parents as soon as born. Their products are used, but they are sterilized. The animals themselves are fattened as quickly as possible and are sent to the slaughter house and their carcasses are disposed of according to their condition, as found upon post mortem examination.

This method is decidedly economical, and has been recommended from time to time in this country, especially by the agricultural press, but it is not practicable in Pennsylvania. Whether it may be practicable elsewhere in this country I do not know, but in Pennsylvania it certainly is not, and I base my opinion upon experience. When a herd is tested with tuberculin in Pennsylvania the owner is permitted to care for his animals according to the Danish system; isolation, sterilization of their product, removal of their offspring, and so on, or he is allowed to accept an indemnity from the state, when his cattle can be destroyed. Although this alternative has been offered to the owners of about ten thousand cattle,

it has not been accepted in a single instance; not even where cattle valued at several hundred dollars apiece have been involved. The owners of the cattle almost invariably say they would prefer to have their cattle killed outright without any compensation to them whatever, rather than keep them under these burdensome but necessary restrictions. These restrictions are not burdensome in Denmark, because Denmark is a dairy country, and they specialize there to such an extent that their principal business is butter making, and it is the general practice in the creameries to pasteurize the cream as soon as it is separated; and the skimmed milk also is pasteurized before it is sent back to the farm to be used for feeding.

Since this is already their practice, it is not necessary to make a change in their methods, and they can follow out the system very well, but in the United States it is otherwise. At present, the Danish system is not feasible. It may be, however, that changes in creamery practice may make it possible to adopt it at some future time, but certainly, at this time, it is scarcely worth considering from a practical standpoint, and the greatest relief that I think the future can bring us will be in the direction of disposing of the carcasses of condemned animals economically. It is found by everyone who has killed and made post mortems of animals condemned by examination for tuberculosis that a large proportion of them are affected to a comparatively slight degree, to a degree that would not injure the consumers of their flesh, provided the carcasses were properly inspected at the time of the slaughter.

Another matter that has been suggested, and has been discussed more or less by the agricultural papers, in reference to the disposition of tuberculous cattle, is this: Is the disease curable? And is it ever profitable to treat a tuberculous animal with a hope of effecting a complete cure? This is a matter that is entirely unsettled. Very little work has been done in this direction; a great deal will be required before an authoritative statement can be made, so all statements that are now made are based upon unproven hypotheses, and the attempts at cure are thus far purely experimental. An ex-

periment station in one of the Eastern states has advocated general attempts at cure, and some of the officers of this institution—although the matter has not appeared in a bulletin—have declared that cure is quite feasible in a large percentage of cases. Such expressions as these are very pernicious. These, Mr. President, are the matters that I desired to refer to in particular, but I should like to say one word more in reference to a subdivision of this topic, and then I will close. That is, as to the estimate of the location and extent of the disease from the tuberculin reaction. This is a matter that has been discussed considerably, but most of the statements that have been made in reference to it thus far are not based on extended observation, and are not of a great deal of practical value. I have had occasion recently to compare the reactions of some hundreds of cases with the lesions found upon post mortem examinations, and I started out with the belief that less of the disease—that is, the lower the degree of development in the animal the higher would be the reaction, because I have seen such extreme instances of this kind, in so many cases, and we know that the opposite is quite frequently true—that very extensively diseased animals react but slightly. However, upon making averages, in hundreds of cases, it appears that the tendency in this direction is not very marked and that there is but very little difference between the average reactions of slight cases and the average reactions of extensive cases, notwithstanding the fact that extreme instances are, as I mentioned, frequently seen, but the averages are about the same. I have the figures upon which this statement is based, but I think it is hardly worth while to present them at this time. I mean to bring them out at some later time in an article upon the subject.

Dr. Clement: I have really very little to add to the discussion, as we have already, most of us, talked ourselves hoarse upon the subject. After all, we are practically of the same mind as to the necessity of reducing the mortality in this disease. That we may not all agree as to the means best to adopt to attain the end, it is of comparatively no moment. I think the best way to control tuberculosis



among cattle, is to formulate such a law as will make it necessary for the producer to free his cattle from the disease, and to take such means as are necessary to keep them free by having his cattle tested when he buys them. If purchasers will take every care to keep their cows healthy at their own expense, and in some way can get official recognition of the fact, those who do not take such pains will establish a boycott against themselves which they can not withstand long; the people will know what dairymen to avoid and what to patronize. In Maryland we have made a very superficial examination of the cattle through the state. That is, we have reported such cases of tuberculosis as could be recognized by what might be called an eye inspection. Although the returns are not all in, it will probably reach from two to two and a half per cent. This, of course, is a large per cent. upon this basis of inspection. A detailed inspection will greatly increase the percentage—so much, in fact, that I am certain that in my state, a sufficient amount of money could not be appropriated by the state to in any way affect the existence of the disease.

I believe we will soon have a combination of the dairymen in our cities, whose cattle will be subjected to inspection at the cost of the producer, and who will take pains to advertise the fact. When this is done, it will certainly be much better for the community, and the other dairies will have to adopt this system or go out of business. I am very glad to hear Dr. Pearson say that some such system is being started in Pennsylvania, and I know that such action is contemplated in Baltimore. I do not think the state should be divorced from supervision altogether by any means. I think where such work is done by private veterinarians, the state should have the right to supervise the work to a certain extent; that is to say, it should have men in its employ whose duty it should be to go about and see who is doing the work honestly and who is not doing it honestly. I believe that tuberculosis is a disease that must be kept under control constantly; it is not a disease like pleuro-pneumonia and many other infectious diseases; that we can handle comparatively easily; it is a disease that affects all animals,

including man. If one species of animal is quarantined something must be done with the others.

If we can however by constant work, by constant supervision, guarantee the public that certain dairies produce milk free from tuberculosis, I think this question will right itself to a very great extent—as much as it can be righted in any way that I know of. This, gentlemen, is all that I have to say upon the subject.

Dr. Salmon: MR. PRESIDENT AND GENTLEMEN: I have spoken so often before this Association on the subject of tuberculosis and expressed my views so fully and positively that I really am at a loss to speak of any phase of the question which I can feel will interest you to-day. I must congratulate you, however, upon the fact that the different gentlemen who have discussed this disease have come very much closer together upon the points involved than we have been in the habit of coming in the past. It shows that constant discussion, year after year; that continuous working upon this disease has been having good effects. We have appreciated more fully the nature of the problems connected with it, and the manner in which those problems are to be met. There is already, I am glad to see, a unanimous feeling that it is impossible to take hold of this disease at one time in all parts of the country, in all parts of the state, by radical measures and so stamp it out. I am glad you appreciate that fact, not because I think it will be an obstacle to the work, but because I know that the more the magnitude of the task is appreciated, the more success we will reach in the end.

In considering how it was possible for the veterinary profession to attack this disease, spread all over the country, affecting so many animals, and involving so many millions of dollars, I believe I was the first to formulate and show in figures what it meant to undertake to test all the dairy cows of a state and slaughter all of those which showed the reaction to tuberculin. I know that some of my professional friends thought I was going rather far and that I was discouraging them in the efforts which they desired to make, but I think that they are now coming around to my views.

The fact that they have been obliged to face this great question has enabled them to devise means by which they could obviate some of the difficulties which they encountered.

Now, one of the most important plans which has been adopted in handling the work has been the persuasion of the owners of affected cows or infected dairies to come and ask for an inspection and feel that a favor has been conferred upon them by the officials who make the inspection. So long as the matter went the other way—so long as the inspector was obliged to go to the owner of the herd and force an entrance upon his premises, just so long, he would be obliged to face public sentiment which was almost unanimously against him, and I care not how strong the law nor how enthusiastic the inspector, if the public sentiment amongst the dairymen of the country is against you in such a work, it is impossible to make much headway against it. Now this other plan, this plan of moral suasion we might call it, this plan of bringing other influences to bear upon the dairymen, makes him feel that it is to his interest to have an inspection; that he must have an inspection, must have the friendship and friendly assistance of the inspector to conduct his business in a profitable manner. This is a very important step towards the successful carrying on of this work and by recognizing it we certainly have accomplished a great deal.

I think I heard my friend, Dr. Parker, make some statements in regard to the control of tuberculosis by sanitary regulations, and I wish he had been more definite as to the regulations by which he believes the disease can be properly overcome without the application of tuberculin in diagnosis of the affected animals. I did not catch his meaning entirely, but I know that the public press and the agricultural press has said a great deal about controlling the disease by sanitary measures, and I never yet have been able to understand clearly in my own mind how the number of animals affected, how the loss from the disease was going to be very greatly reduced by sanitary regulations. Of course I believe in sanitary regulations, as every veterinarian must. I believe in applying all sanitary regulations in existence in this

as in any other contagious disease, but so long as the stables are infected by diseased animals, so long as the atmosphere of those stables is charged with the bacilli of tuberculosis given off by tuberculous animals, I do not see for my part how by any kind of sanitary regulations we are going to get rid of the disease if we allow the affected animals to remain in the herd. Mention was made of the regulations and the practice of England a few years ago in regard to cholera at the time when cholera was epidemic in parts of Europe; that she allowed ships to come freely into her ports and passengers to pass freely into the country without harm. Now, I think it would be a mistake for us to reach very definite conclusions from a disease like cholera and apply them to a disease like tuberculosis. The diseases are very dissimilar, and if you will notice, England has never applied those views to the control of animal diseases. What is her practice to-day? Even with cattle from the United States, where we have very few contagious diseases, practically no contagious diseases that could be introduced there, they are all forced to the foreign animal docks, they are all held strictly in quarantine and every animal is slaughtered upon those docks within ten days from landing. Evidently she does not rely very much upon strictly sanitary regulations to prevent the introduction of cattle diseases. I think that we cannot rely entirely upon sanitary regulations for the suppression of our cattle diseases unless we include among our sanitary regulations the discovery of diseased animals and the proper disposition of them.

Again, as to the slaughtering of all animals which show reactions, there has been a great difference of opinion. It has been claimed, and properly, that a great many animals that show reaction are but slightly affected, and if allowed to live they might not die from the effects of this disease for years, if at all; that they might recover. But how are we going to know in advance which of the animals that showed reactions are only slightly diseased and which of the animals will live for years and which will recover? It appears to me it is impossible for us to reach any positive conclusion by any method of examination which we have in our power,

and that if we are going to try to stamp out tuberculosis, or control it, we must rely upon the best means of diagnosis which we have at our command, and that is unquestionably tuberculin. I think all the animals which react must be treated in the same manner.

Again, I am glad that the question of using tuberculous carcasses is being discussed. Of course I know that there are all stages of tuberculosis. Some carcasses are affected in such a manner that no one would think of allowing them to go upon the market, but on the other hand, there are other animals so slightly affected that no one seeing them would think the carcasses affected at all. There may be only one or two nodules in the lymphatic glands which having been removed from the carcass, the carcass itself is then left entirely free from the disease. It seems a shame to destroy such a carcass; certainly it is a great waste of money. Now if we could educate the public sentiment to such an extent that these carcasses could be placed upon the market without causing sensational statements—without bringing public sentiment against the removal of tuberculosis from the herds, it would be a great thing indeed. It seems strange indeed that there are so many people who claim that these affected animals should not be slaughtered, that they should be allowed to remain in the herds, the milk allowed to be sold in the market, and if slaughtered at all, they should be slaughtered by the owners and sold for food, when, if the inspector talks about supervising the slaughter and allowing only the carcasses free from danger to be sold for food they raise their hands in holy horror and say he is trying to feed the public with diseased meat.

Now, I am glad to say that the Germans are coming around to the position which has been adopted from the first by the Bureau of Animal Industry. That carcasses only slightly affected may be placed upon the market without cooking. All badly affected carcasses, all which show emaciation, all which show a tendency to generalization, should be condemned and rendered in such a manner that they can not be used as food. While carcasses of animals in good condition, carcasses which show only slightly the effects

of tuberculosis in parts where the disease could be easily removed can be safely placed upon the market.

The question in regard to official slaughter houses I believe is important. The ordinary country slaughter house, the slaughter houses in the suburbs of the great cities and all of the small slaughter houses have been abominations; they are the places to which the diseased animals have been taken and slaughtered and from which the greater part of the diseased meat has been placed upon the market. And they are the places it is impossible really to control by inspection, because they are small places, and a few animals are killed there at a time, and irregularly and it is impossible almost to maintain efficient inspection of them. If they could be abolished and we could bring the slaughtering all to a central point, it would be a most important matter in connection with the control of diseases.

A great objection to the central slaughter houses has always been that it threw the work into the hands of combinations of capital popularly known as trusts. It has been an objection made on the part of the consumers, and on the part of those having cattle to slaughter, and if this can be avoided it appears to me that the greatest objection to centralized slaughter houses would be done away with. Gentlemen, I will not say any more; the subject has been quite thoroughly discussed, and I only desire to thank you for your attention.

The President: These are all the names on the list to discuss this subject, but I know that you would be glad to hear a few words from one of our oldest members, and I will ask Prof. James Law to address you on this subject.

Dr. Law: There are some points that have been advanced that I think would bear investigating a little further. We have heard about the use of tuberculin, and of the influence of moral suasion on the owners of stock; to have this thing done, but we have had this essentially from the side of the official veterinarian. Not being an official in this sense, I will say, there is something to be said on the other side of the question. It is used by the owners of herds who wish to be safe from tuberculosis. So far you say it is good. I

would say so too, but they don't care where the animals go that are condemned, and this is really a very serious question in my opinion. At the present time, in localities where the owners of stock are alive to the danger of tuberculosis to their herds, we find them only too anxious to have them tested with tuberculin, but they don't propose to kill them. What becomes of them? They are turned off on unsuspecting purchasers, and the thing has come to such a point that if a man does not test all the cattle he buys, he is pretty sure to buy tuberculous animals, because the animals in the market are too often but the culls of tuberculous herds. We have to thank Dr. Parker and the other New England people for causing New York to be the dumping ground for tuberculosis. No bovine animal is allowed to enter New England without a certificate of a successful test by tuberculin. Cattle coming from the West are stopped at Buffalo and other places in New York and tested, those that stand the test go on with their certificate, and those that don't, go elsewhere—go into the New York herds. Certainly this is not an unmixed good. The question is, can we confine the use of tuberculin to the hands of professional men or state authorities, and whether this method that is now in vogue among the owners of stock will not eventually render it necessary to have all cattle tested according to law. We in New York, with our political appointees looking after tuberculosis, see the danger is a great and very serious one. We are suffering by reason of the protective work in New England; we are suffering from the private work done in New York itself. For my part, I would be afraid to buy cattle from some districts in New York without the tuberculin test. It only takes time for the practice to spread elsewhere. I know more of New York, of course, than other places.

In the matter of the use of the meat from the tuberculous animal, or in the first place, in the matter of preservation of the animal that reacts and yet does not show any falling off in condition, which does not seem to have the disease in an active form, I must say, my own experience has been that a number of animals very badly affected, not only with old caseated and calcified tuberculosis, but fresh, active, growing

tubercles, have been in fine condition, and on more than one occasion the appraiser came back to see the animals slaughtered, thinking that without doubt that a serious blunder had been committed. I have found such fat animals literally loaded with tubercles, I might say, from neck to tail.

I would therefore qualify to some extent the statement that the animal which is in a dangerous condition is necessarily losing flesh.

This matter of the use of the flesh is very nearly like that of trichinous flesh. We can cook trichinous flesh and it will be perfectly wholesome; and the same is true of tuberculous flesh, unless it be to tuberculous persons. The question is, whether desirable or whether feasible, as Dr. Pearson said, to put it on the market—whether it is not cheaper in the long run to destroy it. If these carcasses could be dumped wholesale into a sterilizing apparatus it would be well, but even then the most dangerous part, the internal organs, are not treated in this way.

It is still a very serious question whether it is well or whether it is feasible to put tuberculous meat upon the market. It certainly could be cooked and consumed under a very close supervision. But the expense attendant upon such precautions, cooking and disposal, and in the cases of slightly affected animals, of preserving them under careful supervision, would probably be greater to the state than if they were slaughtered at once and paid for.

With regard to preserving for breeding purposes those animals that react while yet in apparently fine health, there being no objective symptom of disease of the lungs or bowels, for example, there is no doubt, I think, at all that if we could keep those animals apart from others and give them an open air life in pastures that we could raise from them healthy calves, like as they do in the northwest territory, and in that way raise a number of healthy animals.

It is a mere question of seclusion. After all it is a question of expense—of the possibility of securing absolute seclusion.



The President: Gentlemen, the subject of tuberculosis is now in the hands of the Association for discussion.

Dr. Salmon: While in one respect I may be properly classed as an official veterinarian, so far as this disease is concerned, such classification is not proper, and I place myself with the ordinary veterinarian.

Now, it appears to me that the difficulties which Professor Law has pointed out in regard to the moral suasion plan, are due, not to the plan itself, but to the fact that the plan has not been properly put in operation. The herd should be tested by the official veterinarian and the diseased animals properly disposed of. If that were done there would be no opportunity for the owner of diseased cattle to put them upon the market. If moral suasion is used by those who have control of the milk supply, they would not recognize these private tests, but they would require tests by the official veterinarian, who would see that the diseased animals were not sold to go into other herds, or to be slaughtered for meat.

We all recognize the fact that there is danger in the free use of tuberculin, for instance, where the tests may be repeated again and again until the animals fail to react. Now this moral suasion should prevent these private tests as well as to cause the owner to apply to the proper authorities and have his animals tested.

Again, as to the danger of tuberculous meat—it appears to me if diseased animals are slaughtered under professional supervision, there is no danger of meat being put on the market, which is dangerous to the public health. The official veterinarian knows when he looks upon a carcass whether it is diseased or not, and we can trust him to put on the market flesh which is perfectly safe. If we take the other view of the case and say that all those carcasses shall be destroyed, then the expense will be too great to carry on the work, and we will eat the worst diseased carcasses as well as those that are mildly affected.

Again, as to the necessity of cooking. In Germany they cook a great part of tuberculous meat. I understand from one gentleman who has just returned from there, that they

are to a considerable extent giving up the practice of cooking tuberculous meat except in the case of badly diseased carcasses.

Then again there is this one other point. Professor Law states, according to his observations, that a majority of cattle killed, on a tuberculin test, are in a poor condition. That is not in accordance with my observation. I know I have seen a great many cattle killed, on the tuberculin test, where the majority of the animals were in very good condition, in as good condition as the average cows placed upon the market for food.

Dr. Parker: If I conveyed an impression to the members of the Association that I would rely altogether on sanitary measures, I am sorry. I would not neglect tuberculin entirely; but in Massachusetts and in most of the New England states, the condition of the barns is deplorable. If this is neglected it is very serious, and the farmers and others should be educated to improve the existing condition of the barns.

The inspectors in each district throughout the state (Mass.) are supposed to examine every herd in their district, quarantining the bad cases. In this way, the great majority of these are picked out. By far the larger number of cases of tuberculosis, where whole herds are tested, show only very slight lesions, and the cattle are not necessarily in poor condition. Many of the cattle that react are plump, fat, sleek, and in good order with simply a small mediastinal or bronchial gland diseased, and there is no way to tell whether they are diseased or not, except by tuberculin. The whole question hinges on this; if it is impossible to go over the entire state, test all the animals, and kill all those that react, then it is necessary that we should rely more or less on physical examination for the purpose of picking out as far as possible, such animals as may be dangerous to public health.

Dr. Stalker: I will ask the question, whether diseased carcasses should be labeled in order to show they are sold as such, that the purchaser may know exactly what he is buying. What precautions are necessary for the purchaser and consumer to observe?

Dr. Salmon: I can easily see how that question shall be considered as one of the most embarrassing which could be put to a veterinarian and especially to an official veterinarian. I have always been in the habit of expressing my mind clearly on these questions. I could not be in favor of putting any meat on the market which I considered dangerous, and I believe that the distinction which I made between the different classes of carcasses would enable the inspectors to avoid placing upon the market any which were dangerous, and if a carcass is perfectly harmless I see no reason why it should not be put upon the market. There is no more risk from it being sold as healthy meat than the animal that had been affected with congestion of the lungs, or congestion of the intestines or nodules caused by parasites. I have had them to say you should not put meat on the market which is affected with nodules caused by *Oesophagostoma Columbianum*, which is no more injurious than a wart on the skin. If you label it as diseased meat, no one will buy it.

Dr. Cary: Is it not a fact that last year, or the year before, the committee appointed at the meeting of the International Veterinary Congress on this subject decided against the use of tuberculous cattle?

In Alabama, in one of the larger stations, a practical veterinarian was called to test a dairy herd. Over fifty reacted. Some showed physical signs of tuberculosis, but he had no power to do anything, and they went on selling milk and put the cattle on the market and sold them at different places. It is one of those cases that will come up where moral suasion has nothing to do with it, where the man is so after the dollar that he does not hesitate to make it dangerous for his patrons.

There are two sides to this question, the moral suasion and the compulsory. There are some cases I think where compulsion should be employed. In Montgomery we have a public slaughter house where all the animals are slaughtered and inspected by competent inspectors. It is working admirably, and I believe we have as good a system of inspection in Montgomery as anywhere in the United States. It is working well, and gives good satisfaction.

When there is one gland found here and there affected, it is sometimes questioned if there is not a distant gland involved. I think it is best to condemn all of them.

Professor Law: I think if Dr. Salmon and I were working side by side we would agree, but it is sometimes necessary in talking about a matter in this way to refer to points that are not exactly brought out. The statement is made that moral suasion with compulsory slaughter will be sufficient.

Supposing a man wants to put his milk or meat upon the market at an excessively high price, and has his cattle examined with tuberculin, supposing then that he sells off the animals that react to unsuspecting customers and then gets the inspector to test the remaining animals and they all stand the test; hasn't there harm been done? And is not there a strong temptation along this line? I am convinced there is a great deal of harm done now by private tuberculin tests.

Dr. Salmon: Would not that occur any way?

Prof. Law: It would not occur if there was systematic work over a whole district or State made under the authority of law.

Dr. Salmon: It would take three years to go over an entire state, which would give an opportunity for doing the same thing.

Prof. Law: We are coming daily nearer and nearer to the possibility of doing that more thoroughly. We know better what we are about, and we have men better fitted for the work. I did not say that it is not a good thing to employ moral suasion, but unless properly guarded it will indirectly cause harm.

Dr. Baker: I would like to say that in my opinion, the control of tuberculosis can only come through the effect of the education of the public, and that of course must be slow. Most every state has dairy inspectors, and dairy cows should always be tested and new cattle procured subject to the tuberculin test. If it is written and talked about people find it is not safe to buy a cow unless subjected to the tuberculin test. In Illinois many dairy owners are buying their cattle to-day subject to tuberculin test. Those that are

having their dairies tested, want to get rid of cows that reacted. There is no law against it, unless the constitution of Illinois has a clause which provides that if any one can be proven to be a regular dealer in diseased animals, he is subject to a penalty. Why not private practitioners recommend the purchase of all cattle subject to the tuberculin test? What they will do with those cattle that are rejected, is a matter that will lie by itself. It will depend largely upon the state laws under which they might live.

Dr. Hinebaugh: I have had little experience with regard to the control of tuberculosis, living in a state where there is very little of the disease and where nearly all the new cases that occur, are imported. I have taken considerable pains at farmers' institutes to advise the people when shipping a dairy herd or in selling animals, to have them examined. Since carrying on that work, a great many animals have been rejected. We have a good many cattle in Cass County, and since the tuberculin agitation these herds have been built up on the tuberculin test, and we do not find a single animal that reacts. The veterinarian should have some standing in his own community, and I believe if he would he could prevent to a great extent the sale of animals that are affected. Perhaps in the east it is harder to do this, but certainly where cattle are already free from the disease, we can prevent the introduction of tuberculous cattle, and I believe to-day that tuberculosis in North Dakota has at least been reduced one or two per cent. in the last two or three years.

Dr. Gill: One very important thing has been overlooked. We have been testing cattle in New York city as you are aware, and I have been called upon by owners of cattle to be present at post mortems to determine whether the cattle have been affected or not with a view of prosecuting the state officials. I have found in a great many instances that the class to be taught were the veterinarians themselves. I have attended such post mortems in the light of an expert and have found veterinarians with the owners of cattle which were to be destroyed by orders of the Board of Health. I have found them fired up with the importance of

their own ideas, which were just contrary to the ideas that have been expressed here today. Now it strikes me that the thing to do is to educate all veterinarians. There are numbers of our profession who do not belong to this Association, neither do they read the veterinary journals; they do not know the condition of affairs nor do they know what carcasses to condemn. Some do not seem to have the reasoning power or faculties to determine right from wrong, but in a number of instances a few moments talk with these gentlemen have convinced them that they were in the wrong and in nearly every case they agreed with us, and we are meeting with little objection in the city of New York.

Dr. Lowe: I would rather listen than be heard, but I would like to say I have been very much interested in what has been said in regard to the inspection, and extermination of diseased animals and also to disposing of affected carcasses, but the stamping out of the disease is one thing, and keeping it out is another, and I think it would be well for all veterinarians, especially those that have to do with official work, to bear in mind the importance of this. We must breed from animals of good constitution and stamina. We know that all persons that take baccilli into the system do not develop tuberculosis; we know that certain individuals, in other words, have greater resisting power than others. Likewise certain animals have a greater resisting power to the microbes than others, and for that reason great attention should be given to breeding, and in connection with it sanitation.

Dr. Salmon: Something was said about an International Veterinary Congress. As Mr. Pearson spoke on the subject I would like to ask him to explain what action was taken by that Congress.

Dr. Pearson: I have had occasion to look this matter up lately and find that the International Veterinary Congress held in Bern in 1895 discussed this subject very extensively, and at the close of their discussion, after several articles had been read, a resolution was adopted giving the views of the Congress in relation to this matter. Now I am very sorry indeed that it is not possible for me to read the resolution or

to quote it accurately. I haven't it before me but from memory it is similar to the statement made when I was on the floor before, that is to say, the flesh of tuberculous animals is allowed to be sold for food without restrictions of any kind, when the disease is confined to a single organ or to a single organ and the organs in intimate connection, such for instance as the lungs and the adjacent lymph glands, or the liver and the portal glands, or the intestines and the mediastinal glands, and those parts are removed and the carcass placed on the market without restriction. But if the disease is more advanced but still not extensive, the meat is marked as tuberculous or is cooked and is sold, whereas if the disease is extensive, generalized and the animal emaciated, the carcass is destroyed outright. Now while I cannot give that accurately, I have before me the regulation made by the German Ministry of the Interior, Agriculture, Education and Commerce—the department of the government in Germany that has control of this matter. This regulation is the last that has been issued in Germany. It appeared on the 26th of March, 1892, and it provides that the flesh of tuberculous cattle shall be looked upon as unwholesome when the meat itself contains tubercles. On the contrary the meat is to be regarded as wholesome and edible when the animal is well nourished, in good flesh and the tubercles are confined to one organ; or in case two or more organs are affected they are situated in the same body cavity and are connected by vessels, so that according to these regulations comparatively a very small quantity of meat is excluded from the markets, and in consulting the slaughter house records, published every year by the German slaughter houses, I find that no more than ten per cent. and usually less, usually not more than four or five per cent. of tuberculous carcasses that are examined there and condemned are destroyed outright, and ninety to ninety-five per cent. are destroyed in part or cooked, or sold as tuberculous meat, or, as is the case in many instances, sold without restriction of any kind whatever, the tuberculous organs or lesions being entirely eliminated.

Dr. Cary: The Committee at the International Veteri-

nary Congress reported that it was safest and best to destroy the meat when the carcass was affected. Where diseased meats are sold in Berlin and other cities, they are not put, as Dr. Pearson says, before the people as absolutely healthy meat.

Dr. Pearson: I would like to ask when the convention referred to was held. I am aware that in 1884 a convention was held for the special discussion of this subject, and at that time the resolutions adopted were very stringent and far reaching. The profession has receded a great deal from the position taken at that time, and in 1895, according to the report I have, the position taken was very liberal and in general conformed to the German.

Dr. Cary: I cannot give positively the year, but I am under the impression it was 1895 or 1896.

Dr. Salmon: I have made it a point to bring up the discussion of the International Congress on this question. If reported at all, my memory is in accordance with that stated by Dr. Pearson. The second Congress, I forget what year, I think it was in 1894, had a very radical report. I believe it was directed to the congress, and the resolutions adopted by the committee were quite radical. Since then much less radical resolutions have been passed in a more recent congress, and the members of that committee formally expressed there at Lombard, that they were entirely too radical, that they had been carried away by this radical report, and really over half of them believe it at this time.

On motion further action was referred to the Committee on Resolutions.



## A REVIEW OF THE FIELD OF VETERINARY SCIENCE,

BY LEONARD PEARSON, B. SC., V. M. D.

It is well that we put aside our regular work from time to time and meet in this fashion, and upon such occasions it is appropriate for us to review the recent progress made by ourselves and by our profession. We can thus take our bearings and ascertain exactly where we stand in relation to the other professions, the commerce of the nations and to our own past. There is also a temptation, particularly strong at such times, to peer into the future. So long as we confine ourselves to our regular work, to the plains and the valleys of things that are familiar to us, it is not possible to obtain this information nor to make these observations. It is only by comparing experiences, by adding the newly acquired knowledge of one member to that of another, by eradicating the ruts into which we fall so readily and by resting our personal knowledge, thus improved and amplified, on the mountain composed of the accumulated wisdom of the ages that we can obtain a complete view of our immediate surroundings and relations and even an imperfect glimpse into the future.

In reviewing the field of veterinary science, it is necessary to briefly consider the growth of this subject in order to fully realize our present station. The beginning of veterinary science coincides with the beginning of medicine and is buried in the history of ancient Egypt and India. It is well known that the ancient Egyptians owned and cultivated domestic animals, especially the dog, ox, ass, goat and goose. There is also evidence that the Egyptians bred antelopes in immense herds and that this practice was given up some two thousand years before Christ because other animals, particularly the sheep, displaced them. Although animals have been domesticated in all parts of the world, in more recent

times, the present list does not include more than twenty-five species and has received no additions for several hundred years.

Animals constituted the principal wealth of the ancient roving tribes that covered Asia and gradually worked their way into Europe and Africa. It is but natural that when accident or disease overcame this valuable property that attempts should have been made to save it. Thus veterinary medicine began. As new views and theories arose in reference to the treatment of diseases of man these were applied without essential modification to the treatment of diseased animals; but the early assistance that general medicine derived from veterinary medicine is far greater than this, because custom did not permit the dissection of human bodies and all anatomical knowledge was obtained by dissecting animals and all knowledge of the processes of disease was derived from the same source.

As time passed, more and more attention was devoted to the study of the diseases of man, and veterinary medicine was relegated to an inferior position. This tendency increased until, as a result of certain influences, domestic animals became valuable and indispensable, when it became apparent that something should be done to develop means for controlling the diseases that swept them off by thousands, threatened the health and interfered with the prosperity of the people.

With the revival of learning in the sixteenth century the study of veterinary medicine was taken up by many men of much ability and of high station, but these men were not skilled in the fundamental branches of medicine and their labors consisted principally in rearranging and compiling the knowledge that had been acquired and recorded by their predecessors. In other words, veterinary medicine was not studied from a medical standpoint but from the standpoint of agriculture and we find the writings on veterinary medicine included in larger works on rural affairs.

At that time, there were many books on horsemanship; the breeding and general care of animals and on animals in their relation to agriculture, but scientific treatises on veter-

inary medicine in any of its phases were lacking, with the single exception of the Anatomy of Carl Ruini. This book, issued in the year 1590, marks the beginning of scientific veterinary literature but, strange to say, the other branches of our science developed so slowly that it was not until two hundred years later that works on the other fundamental branches equal to the Anatomy of Ruini were available.

However, sufficient progress was made during this early period to indicate that the science was of value and as changed conditions developed in the habits of the people, in agriculture, in transportation and in warfare, the infectious diseases of animals became more widespread and caused more and more oppressive losses. The diseases that caused the greatest losses during the seventeenth and eighteenth centuries were anthrax, foot and mouth disease, lung plague, rinderpest, glanders, influenza, distemper, mange, sheep pox and various helminthic diseases.

In the last century, while all of the communicable diseases prevailed more or less extensively, rinderpest was most prevalent and caused the greatest amount of distress and loss. It ravaged the southern provinces of Russia, Poland, many of the states of Germany, Hungary, Austria, Italy, France and Switzerland. It was so virulent in Holland that more than 200,000 cattle were destroyed by it in 1714. In Italy 70,000 cattle died in one year. During the entire century the disease came and went in waves, certain years being marked by especially severe invasions. For a time it subsided in Holland to such an extent that the herds were re-established but in the two years from 1744 to 1746 another serious invasion occurred and once more 200,000 cattle were lost, thus impoverishing a large proportion of the population. A number of serious outbreaks also occurred in England. In 1747, 40,000 cattle were lost in Nottingham and Leicestershire and 30,000 in Cheshire, in six months after which the progress of this plague was checked by the slaughter of about 80,000 animals. Foot and mouth disease prevailed extensively in France and other continental countries and anthrax rendered it impossible to rear live stock in many

localities in Europe. Glanders also prevailed very extensively in all parts of Europe.

It was at about this time that the stage coach became prominent and vast numbers of horses were needed for this new work. There were also great numbers of large estates where many horses were bred and the need of more knowledge and better skill in treating them became painfully apparent. The cavalry and artillery arms of the military service were also in a state of rapid development and veterinary knowledge was in great demand in this connection. The field was ripe for the establishment of a veterinary school and when Bourgelat organized the first one at Lyons it was received gladly and recognized in all parts of Europe as a great advancement. The success of this institution was so great that students were sent to it by all of the principal rulers and they in turn established veterinary schools in their own countries, all of them closely copying the French system.

While the success of these schools was very great, in so far as obtaining students and government aid was concerned, the fact remains, and sad as it is it must be stated, that the results of these schools for the first decades of their existence was most disappointing and they did not succeed in drawing to them as students young men who were well trained and came from the better classes of society. While the pupils sent by foreign governments were of the better class, most of them being surgeons, skilled horsemen and educated agriculturalists, those that followed and constituted the great majority of the student body in all of the veterinary schools during the first years of their existence were from the lower classes, and it is reported that many of them were unable to read or write. The teachers in these schools during this period, which has very properly been termed the "Empirical Period" in veterinary education, were not well trained veterinarians because there had been no opportunity for the development and acquisition of a thorough knowledge of veterinary science. Most of them were surgeons who had a certain fondness for animals and who had amplified their knowledge of medicine by adding to it some of the empirical,

unscientific and in large measure worthless teachings of the existing literature. Of course it could not be expected that the influence of the old empirical systems that had grown and developed for hundreds of years could be thrown off at once and a scientific course in veterinary medicine could not be given before the science of veterinary medicine existed.

It is therefore not surprising that the veterinary schools failed to accomplish the work that was expected of them and succeeded only in turning out men who were not above the level of the best of the unschooled veterinarians who preceded them.

Another condition that has an important bearing on veterinary medicine was the change in the method of transportation that followed the introduction of steam locomotives. This led to a sudden and tremendous increase in domestic and foreign commerce, to greater activity in all kinds of business, and the establishment of keener competition in rural affairs and the development of new systems of husbandry. Under the old conditions, local wants were supplied entirely by local products and what a locality did not produce was not consumed in that district. With the improvement in the methods of transportation, moreover, the wants of the people increased at least as rapidly as the means for supplying them and changes were seen not only in methods of conducting businesses, but also in the social life and especially in the food of the people.

Lyden, in a scholarly paper read before the last International Congress, at Bern, called attention to the influence of this development on the diet of the people, and has shown that while meat is now at least three times as expensive as it was sixty years ago, about three times as much per capita is consumed by the inhabitants of European countries. It seems to be well established that the degree of activity of a people is indicated by the amount of flesh consumed. A more than proportionate growth has occurred in the consumption of dairy products. It is not necessary for one to be very old to remember when milk was a rarity and butter a luxury and to recall how these articles of diet have displaced other substances made from fruits and vegetables.

The fashion in clothing has also changed to such an extent that far more wool is now required to properly clothe a person than was needed a comparatively few years ago.

All of this has led to an astonishing growth of the live stock industry, so that the public is far more dependent upon it now than it was in the last century when the first veterinary schools were established. The growth of veterinary science has been proportionate to the growth of the industry that is protected by it and without such development in veterinary science the live stock industry could not have attained its present proportions and the progress of the whole people would have been restricted.

When it became evident in the earlier decades of veterinary education that the schools then in existence were not properly filling their functions, and after a sufficient number of well trained veterinarians had developed, a thorough reorganization was accomplished, for the purpose, as expressed in the report of the German Royal Commission, "to improve the present empirical material and, in addition to the practical veterinarians that now exist, to educate scientific veterinarians who can be employed to direct veterinary police measures and to teach in veterinary schools." As a result of this change, which was made in all of the original schools veterinary education became more scientific, the scope of the schools was enlarged, more and better teachers were appointed and the result has been gratifying in the highest degree. Fortunately, these changes were made in the earlier years of the present century and their effect has been evident for more than two generations.

Let us consider, for a moment, what good has been accomplished by the veterinary schools and what effect their work has had on national life and prosperity. Undoubtedly, the most effective work has been in the direction of controlling the infectious diseases of animals. Rinderpest has been exterminated from Europe and does not prevail anywhere extensively, excepting in South Africa, where it is now numbering its victims by thousands and is interfering most seriously with the progress of the country. If South Africa belonged to a state of Continental Europe their efficient

veterinary police measures would have been introduced long ago and the disease exterminated. Unfortunately, England does not avail herself of the highest veterinary skill and thus there is no opportunity for the amazing results that have followed its application in Continental countries.

Lung plague, or contagious pleuro-pneumonia, has been controlled to such an extent in Europe that it does not cause serious losses at this time. Notwithstanding the fact that it once secured quite a foothold in this country, modern methods as administered originally by Drs. Law, Thayer and Lyman, and later by Dr. Salmon, have succeeded in entirely eradicating it. When we remember that pleuro-pneumonia was especially virulent in this country, due to the new soil that it found to operate on; that this is essentially an agricultural and cattle breeding land; the immense scope of our territory and the foothold that the disease had gained, we can justly consider its extermination one of the greatest triumphs that veterinary science has achieved at any time, in any country. If the disease had been dealt with as it was in England at that time it would have spread over the entire face of the country and caused losses amounting to so many millions of dollars that it is impossible to calculate them.

Anthrax has been studied with such success that an efficient vaccine has been discovered by means of which animals can be inoculated and the development of the disease prevented. Moreover, so much light has been thrown on the life history of the germ that we now know what measures must be taken to prevent the spread of this disease, or its establishment in a certain locality after it has been introduced.

Foot and mouth disease, although it still occurs in most of the Continental countries, has succumbed to the veterinary police measures that are enforced to such an extent that it has not caused serious loss for a considerable number of years.

Mange of horses and scab of sheep, diseases that were formerly dreaded so acutely by horsemen and shepherds, are now comparatively rare. Distemper and glanders of horses

occur from time to time but they are kept in check so well that they no longer seriously menace the horse breeding industry.

Texas Fever, a disease which formerly destroyed thousands upon thousands of cattle every year in the United States, has been studied at first with such success by Drs. Theobald Smith, F. L. Kilburn and later by others, under the auspices of the Bureau of Animal Industry and state experiment stations, that preventive measures based on their discoveries are so successful that outbreaks of Texas fever are very rare north of the "Texas Fever Line." A few years ago outbreaks of Texas Fever were very common, they occurred in the most unexpected localities and destroyed so many cattle that drovers and farmers were kept in a state of constant apprehension. Last year there was but one small outbreak in Pennsylvania and this year not a single case has been reported in that state. This, also, is one of the greatest triumphs of veterinary medicine. But development in this direction is not complete and the researches that are now in progress will, it is hoped, lead to some effective measures under which northern cattle can be introduced with safety into southern states and southern cattle can be brought north at any season.

Hog Cholera is a disease upon which a good deal of light has been shed during the past few years, but we are still without an effective means of preventing its ravages.

Tuberculosis is an affection that is arousing much discussion at this time, is occasioning most extensive losses and must be dealt with more seriously in the near future.

The immense field opened by the discoveries in serum-therapy is of equal interest and importance to the physician and veterinarian and much of this recent development results from the work of distinguished members of our profession.

The international trade in live stock has developed enormously during the past few years. It is a comparatively small matter to ship cattle three thousand, four thousand or five thousand miles, and with modern facilities these journeys can be made in a very few days. International trade



in live stock and live stock products, such as hides, skins and wool, has also reached immense proportions. These also are carried quickly between points on opposite sides of the world.

It will thus be seen that without proper supervision it would not be difficult for the most dangerous diseases to be carried long distances from the most remote countries into previously uninfected territory. But every civilized country has a force of efficient veterinarians and a more or less perfect system of quarantine and control by means of which the ravages of diseases that would otherwise be conveyed by this international commerce are avoided. It is appalling to consider the effect upon the nations of the abandonment of these systems. The United States would become reinfected with lung plague, and we would quickly import the foot and mouth disease, sheep pox, swine erysipelas, durine, and possibly rinderpest and other deadly affections. Our live stock industry represents an investment at this time of about two billion dollars. A few of these diseases if uncontrolled by the application of modern veterinary measures, would quickly devastate it to the amount of 25 per centum at least.

This means a loss in cash value of \$500,000,000.00 and there is no telling where the calamity would stop. On account of our somewhat isolated position we can protect ourselves better from the invasion of infectious diseases than the countries of Europe. There it is necessary to keep up a constant control of the most elaborate type, but it is successful in protecting the vast wealth invested in live stock and in perpetuating the most important food supply of the country.

The *indirect* importance to agriculture of protecting our animals is made apparent when we consider the value of their manure and attempt to imagine the appearance of our fields and farms unfed, unrenovated by this plant food. While some districts could subsist for a time under these conditions the vast majority of our farms would gradually lose their fertility and become barren wastes.

In addition to the protection of the live stock industry as

a whole, which, it is evident, is essential to the continued prosperity of the country, the veterinarian finds important and remunerative occupation in the treatment of individual animals. As veterinarians become more proficient it is becoming more and more evident to the owners of live stock that it is not profitable to allow their animals when ill or injured to languish or die or make such imperfect recoveries that a large portion of their value is destroyed, when many of these losses can be prevented by the employment of suitable veterinary skill. The veterinarian not only enables the live stock owner to save money by preserving the life of his animal and restoring it to usefulness, but it is also economical to know that animals in certain conditions cannot recover. They can then, upon the advice of the veterinarian, be destroyed painlessly and the owner avoids the purchase of special food, medicine and appliances and many days of expensive attention.

In its relation to public health, veterinary science is constantly growing in importance. It is well known that a number of diseases to which people are liable can be conveyed by flesh and milk and the long continued experience of several of the most highly civilized European countries teaches us that these important foods cannot be properly guarded and their healthfulness assured without the employment of veterinarians to examine, inspect and advise in reference to the management of the animals that produced them, the conduct of the dairy, the character of the flesh as determined by post mortem examination and the care of these delicate foods until they are consumed. In Germany, nearly every city has a municipal abattoir wherein all cattle killed for local consumption must be dressed under veterinary supervision. Each abattoir is under the management of a veterinarian with the title of Director who performs all the inspections himself, or, if the business is too great for this, is assisted by as many veterinarians as may be needed. In Berlin, about one hundred are engaged in this work. The assistants are not, however, continuously employed. They are, in most cases, local practitioners who are engaged to devote certain hours each week to this work and are paid in

proportion to the time occupied. In this country, the National Government, through the Bureau of Animal Industry, finds it necessary to employ a large number of veterinarians in work of a similar character.

The relation of the veterinarian to the improvement of live stock, through the introduction of improved breeds and species and improvement by care and selection is a very important one, but one that has not received sufficient attention in this country. While there is a high general adaptability to their special purposes of the various species and varieties of domestic animals that are used in the United States, there is still room for great improvement, and the average individual efficiency should be increased from 25 to 50 per cent. This can only be effected by a more thorough understanding and general application of the principles of breeding, selection and heredity, by the education of breeders to recognize and more fully appreciate the valuable points and the defects of animals kept for different purposes, by the better feeding and care of animals during the formative period and by a closer observance of the laws of hygiene and sanitation. Much can be accomplished through agricultural fairs and exhibitions and live stock shows. Every veterinarian who has visited many exhibitions can recall instances of a most dangerous and destructive character wherein animals with hereditary unsoundness and defects of conformation have been awarded premiums. It is the duty of every veterinarian to thoroughly post himself on all branches of zootechnics, on breeding problems and general live stock affairs, so that he may be qualified to serve in an advisory or executive capacity at live stock exhibitions.

In view of the past achievements of veterinary science and the local, national and international importance of its work at this time, there can be no question as to the future of this profession. In order, however, that the highest development may be obtained it is necessary that we should grasp the full significance of our labors. The trained veterinarian is naturally the expert on all live stock questions and upon him devolves the responsibility for the improvement and extension of this foundation branch of commerce and

national prosperity. When viewed in these enlarged relations, there is more need for veterinary knowledge now than ever before; but to satisfactorily fulfill all of these modern requirements it is necessary that the veterinary students should receive more special training in some subjects that are now looked upon as minor branches by most of the veterinary schools.

When the veterinarian is the generally acknowledged expert on all questions of animal husbandry and is freely consulted in matters of hygiene, breeding, selection and feeding; the construction of stables and related matters, as well on pathological questions, his field of usefulness and occupation will have become so broad that there will be a far greater demand for his services in every breeding and farming district, and this will continue to grow as the direct advantages afforded by such consultations become evident.

## THE VETERINARY FIELD IN THE SOUTH.

BY W. H. DALRYMPLE.

One of the first thoughts that occurred to me on learning that Nashville had been selected as the meeting place of our Association in 1897 was, that we Southern veterinarians had certainly great reason to congratulate ourselves, that at last the Southern States were to be honored by an assemblage of the representative body of the veterinary profession of this great country. And not only the profession, but the entire stock-owning public of the South, that in this the advent amongst them of gentlemen, trained and educated in the noble calling of alleviating the sufferings of nature's dumb nobility, there is the prospect to them, and that at no remote period, when the empiric will have to yield up his place to the man of scientific training, and when the darkness of ignorance and superstition, in the care and treatment of their domestic animals, will be dispelled by reason and intelligence.

As Southern veterinarians we appreciate the honor conferred on us by our National Association, in this the inaugural Southern meeting. It is my sincere hope that this day will mark the beginning of a new era in the progress of the Veterinary Profession in this rich, fertile, and rapidly developing section of the Union.

That we, who have cast our lot with this high-toned, generous-hearted and chivalrous people, may be stimulated to labor on in the good cause of professional progress, that we are to perform a most important part in the control and eradication of transmissible animal diseases, some of which are fatal to man.

In dealing with my subject, "The Veterinary Field in the South," I purpose viewing it under three heads, viz: The

value of the Veterinary Profession to the public; to the individual; and from a professional standpoint.

We as a profession are in the position to aid, in the conservation, both of the public wealth and health. In the more Southern States our work so far has been mainly educative. Our people have been so long enthralled in ignorance and superstition regarding animal diseases, that time alone will bring about those changes we all so much desire for the benefit of the public and the profession alike. The lack of knowledge which has prevailed in many sections of the South is largely excusable, for the reason that but few educated veterinarians have taken up their abode among us, and those chiefly in the larger cities—so that the country or agricultural districts have had no one to depend upon but the superstitious empiric. Our medical friends, failing to appreciate the parallel lines along which the two branches of medical science run, were unable to render any help to the suffering animal; and consequently their assistance in correcting error and empiricism among the people, or in advancing the cause of comparative medicine, has been almost *nil*.

These conditions are, however, surely changing. Our medical brethren are becoming more interested in the work of the comparative pathologist. Improved stock-raising, which has been in abeyance for a number of years past, is again looming up. Our people are becoming more and more alive to the almost incomparable facilities and advantages the country and climate afford for this industry.

Concomitant with the advancement and progress along this line in the last few years, there is the desire, nay demand, for intelligent and scientific aid in the hygiene of live stock, and more particularly that section of it which deals with infectious diseases; and it is here that the value of the veterinarian, as a public officer, can hardly be overestimated. Our experience is a necessary corollary to the experience of the human pathologist. Sometimes we can add to the general knowledge, and sometimes we can correct the errors which so easily beguile the investigator unaccustomed to the diseases of the lower animals.

At times glanders prevails very extensively in the more Southern States, and the unscrupulous dealer disposes of the diseased animal with the result that a whole county or parish is soon infested with that horrible malady.

There are many infectious diseases of the lower animals we might mention, which make serious inroads upon the wealth of our communities, and with which only the veterinarian can deal intelligently and effectively. This is especially true of tuberculosis. I would like to impress upon my auditors, and if I could, every community in the South, the value of the services of the veterinarian to the public in the control and eradication of this inter-communicable and most fatal of maladies.

Our Southern country is by no means free from this scourge amongst our herds. It has come under my own observation in some of the rural districts of Louisiana; and in a somewhat recent report by the veterinarian to the New Orleans Board of Health, the percentage of reactions to the tuberculin test in some of the dairies in that city reached as high as forty-eight.

It is an almost daily occurrence in the South to witness some poor animal tortured by having the greater portion of the nictitating membrane of the eye excised for the supposed purpose of curing "weakness of the loins;" the operation being known as "cutting out the hooks." A case of fistulous withers is treated by "cutting the cord in the nose;" the cord, so far as I have been able to make out, being a portion of the tendon of the nasalis longus muscle. Should this fail, a part of the tail is then amputated, or a further operation may be, cutting away a portion of the ear. Colic is frequently treated by pouring a little spirits of turpentine upon the sole of the hoof; or by some of the more advanced therapists, by emptying a spoonful or two of sublimed sulphur into the ear of the suffering animal. A recent discovery (?) in the treatment for anthrax, as published in one of our newspapers, is to give the animal a kitchen spoonful of saltpetre, and then turn him loose. This is recommended as an absolute cure for the disease. A dog that is supposed to be affected with worms, is dosed with a few percussion

gun caps as an anthelmintic. The cow, when she stops ruminating, is treated to an oily dish-rag, or a chunk of rusty bacon. Indigestion is commonly diagnosed as "hollow horn," or "hollow tail," which calls for boring into the horn with an augur or gimlet, or the splitting of the tail, and the insertion of pepper and salt. There are many other instances of empiricism.

The greatest value of the veterinarian to the stock-owner, however, is in his knowledge of animal hygiene. The educated veterinarian of to-day is, or ought to be, familiar with the nutritive value of the various food-stuffs; the mixing of the same to produce properly balanced rations for the specific requirements of the different animals.

There are certain chemical changes which take place in some of the leguminous crops, as pea-vine hay, so extensively used in the sugar raising districts of the South, and with which it is well for the veterinarian to be familiar. One of the chief of these is the development of potassium nitrate. This is brought about by the action of moisture or fermentation on the potash, in which the stems usually abound, and the nitrogen remaining in the vines after the fruiting of the plant. Nephritis amongst sugar plantation work stock has been quite prevalent in Louisiana during the past summer, rendering them unfit for service, and in some cases producing death. The pea-vine hay in use had been looked upon with suspicion, not only on account of mould, but it was feared that the salt referred to was being developed; and being fed continuously and for a length of time, was acting as an excitant to the kidneys, and was responsible for this condition. Quite recently, samples of hay in this condition, were analyzed by the chemist of one of the State Experiment Stations, with the result that nitrate of potash was found in abundance.

There are numerous ways in which the veterinarian can be of value to the individual stock-owner in the South, provided his information is sufficiently extensive. He ought to be familiar with the proper adjustment of harness, more especially those used in the plough, for the reason that many valuable animals are either permanently injured or alto-



gether destroyed by improper gearing. He ought to have a good idea of stable construction, so as to insure the greatest comfort and safety to the animals. Sanitation, also, should be one of the most important items in his stock of knowledge. The subject of labor, *i. e.*, the amount of work, under ordinary conditions, an animal is capable of performing; and the question of draught also. In fact everything having a beneficial effect upon the health of the live stock, the veterinarian should be more or less familiar with.

But besides this necessary knowledge, so to speak, it is surprising what an impression the veterinarian can make upon his client, should his knowledge extend even a little further. A familiarity with the breeding of live stock; the specific qualities of the different varieties; the kinds best suited to climate; the best strains for beef or milk; the sheep best adapted for mutton or wool; the principles of cattle feeding and fattening, etc.

There can be no doubting the fact that we need a greater number of qualified men in the more Southern states; but as I stated at the commencement of my paper, our people, although becoming daily better informed, through various sources, have still to be more extensively educated as to the value, to them, of the veterinary profession. The question may be asked, how are they to receive such education? It will have to be done by the veterinarian. Up to the present time, it may be said, that the field has been almost exclusively in the hands of the non-graduates.

What has been the result? Lack of progress. Nothing else could have been expected. Whatever enlightenment the more intelligent of our people have received, has been obtained chiefly through the reading of popular veterinary literature.

It may be said of the Southern Veterinary Field, as it is of the "Foreign Mission Field": The harvest is plentiful but the laborers are few. It has got to be won by missionaries. Men who are devoted to their calling; men who have the interests of their profession at heart; men whose actions, both professional and social, are beyond reproach. They have to use the horse-lot for an operating room, or the cow

stable or hog-pen for an hospital; these are the habitations of the dumb creatures which it has been their life-study to be able to relieve from pain or sickness, and duty calls them there, but that need not detract one iota from their social standing, or their usefulness as honorable and valuable citizens of the community in which they live. In order to uphold the dignity of our calling, however, it should be our constant endeavor to throw a professional halo around all of our actions. Our business relations and associations should be such as to impress those with whom we are brought in contact, that although our knowledge has been acquired in the interest, chiefly, of the lower animals, our scientific education and our demeanor entitle us to the rank of professional men.

The Southern field must be opened up and cultivated by the veterinarian himself; and when our public bodies, which are organized in behalf of the health of the people and the individual, or the stock-owning public generally, begin to realize what manner of men the veterinary profession is composed of, the field will, I feel confident, more rapidly develop; and there will be a demand made for legislative enactments, by the people themselves, for their own protection, which will bring along with it protection for the profession as well; and I know of no event that could have happened, so much calculated to inspire confidence in our people, or give stimulus to the adoption of new life amongst those of us who are representing the profession in the South, than the visit of our National Veterinary Medical Association to Nashville in '97.

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#### DISCUSSION.

Dr. Butler: I think it is a rare opportunity for the Southern Veterinarian. There is an idea that the Southern states are unhealthy. Veterinarians do not want to go there because they are afraid they will die of yellow fever and malaria. There never was a more radically wrong impres-

sion. Our death rate is lower than in the state of Massachusetts. Hundreds die in the state of Massachusetts from tuberculosis where one dies in the south from malarial poison.

The social standing of the veterinarian in the south is better than in any place in the north. In the south we have but one social class of white people. If an intelligent man goes there and behaves himself, keeps himself respectable, he can go in the best society. There we have not so much wealth in the agricultural sections, but to the veterinarian, in a social way, the south is the best place I know of.

We hear it said constantly that the Southern people do not appreciate education. They do appreciate the services of any educated man when he places his services in such a light that they can understand him. The management of the greater part of our stock in the South is controlled by educated men. True, the negroes may have them in their charge and poor white people may have them in possession, yet to a large extent the stock is controlled by educated people.

I don't want you to understand that a man can go in there and make a fortune, but there are many veterinarians in the North who are scarcely making a living, who could make a good living if they went South. My chief object is to try and dispel the idea that there is not a good field there for a bright young man in a professional line. That is a mistake.

Dr. Cotton: I am glad to hear the South is the field for the veterinarian because I have been all over the South. I know there is a field down here, and in time, there will be a great change in matters in relation to the veterinary profession.

Dr. Heitzman: I can assure the veterinarian of a hearty reception in every Southern state, and that the field is open for him has been demonstrated to every veterinarian that has ever attempted to practice in the South. As to the progress made in veterinary science, I think the few veterinarians we have are, as compared with Northern states, advancing favorably.

New Orleans has the best meat inspection service in the

country. All our slaughtering is done in public under the supervision of the Board of Health, there being an ordinance requiring that every piece of meat inspected to be put on the market shall bear the tag of the Board of Health.

Dr. O'Connell here offered a few remarks along this line.

Mr. B. F. Cockrill: The chief reason why the profession has not been well looked upon in the South is that when the men came among us, the first thing they learned to do was to drive a piece of iron in a horse's foot, and then they were able to practice cutting cow's tails off and sawing their horns off and administering rags, and ten thousand other foolish things until they became odious, but when the true men came south, when our schools were inaugurated in the the South and young men came forth that could tell the people something, then they began to recognize it as a very high science, even in my estimation above that of the medical profession. There is no limit in this field to which you can not go by means of sanitary regulations connected with animals, in the civilization and progress of mankind. There is absolutely no limit to veterinary science; it is one of the grandest sciences known to man.

We will welcome this profession and all professions. There are great fields, there are great industries in the South. The production of cotton and sugar requires perhaps a larger use of work animals than your Northern states, because you handle yours with improved machinery and the improved machinery does not reach these two products as rapidly. Cotton and sugar have to be plowed with mules and horses, and the death list among them from infected food, which we have to import from the Northern states, is very high. You will be recognized, welcomed and appreciated there if you have any appearance of culture, but if you have not I would advise you to stay away from there.

Dr. Wheeler: As far as climate is concerned we have attained the highest elevation east of the Rocky Mountains in North Carolina, of which I am now a resident, and have a section that is below the sea level, of which I was a resident practitioner for about five years. We have some of the greatest health resorts in the South, which are becoming

centers of education and civilization, and we also have some very unhealthy places; there is no denying that. There is no profession that can do more towards purifying and improving the sanitary plans than the veterinary profession can, in the South as well as elsewhere.

One point more, in regard to the healthfulness of the climate. I am at the present time associated on a farm that is unique in its way in many ways; it is Biltmore, in N. C. There is nothing like it I suppose in the world, certainly not in this country, as a farm or as an estate, in its entirety. Mr. Vanderbilt, who is the happy owner of this place, having travelled all over this broad world, after viewing the scenery of Switzerland and America, and breathing the air on oceans and mountains, made up his mind that the most perfect climate in the world was in Asheville or thereabouts, and he has built himself a most wonderful home, wonderful palace, surrounding himself by the most wonderful farm, perhaps, in the whole world. One thing, he certainly recommends the climate of certain portions of the South. (Applause.)

The President: We have with us to-day an ex-President of the State Board of Health of Tennessee, Dr. J. D. Plunkett, who I will ask to say a few words to the Association on this subject.

Dr. J. D. Plunkett: I feel that I am really in a medical association. I readily recognize that the two professions are linked together, and think the progress you have made in the last twenty-five years warrants that statement to-day. I have looked with a great deal of interest upon the work of the veterinarians. In the South we are always glad to see competent men who are disposed to be gentlemen, as every genuine, well educated veterinarian would be. There is a great opening in Tennessee alone for veterinarians. I think it is said that out of our two millions of people there are but twelve veterinarians. That would seem to indicate a scarcity. In the years while I was identified with the state work I often felt the need of a competent veterinarian in some of the outlying portions of the state with a view of getting facts and making a diagnosis to look into

the matter of tuberculosis and report. In Tennessee we have as you know a peculiar disease, not alone confined here, but there is quite an area, Tennessee might be called the center of it, embracing some of the adjoining states. It is what is called the milk-sickness. We have never gotten at the true pathology of it. We are in need of some scientific help from the veterinarian in finding this out. The State Board of Health had in view the organization of such a body as the government has appointed, a commission composed of certain representatives, among them a Veterinarian, Chemist, Bacteriologist, etc. We want help; this is a mysterious disease. This is one of the class of studies we want to push to a successful issue. There is where we need your help. I sincerely hope you will consider our needs, and will see that the near future supplies them. The field is large, there is an abundance to be done, and the laborer is worthy of his hire, and I think he will receive it.

## OSTEOPOROSIS,

BY DR. C. A. CARY.

This is a disease of horses and mules, in which the bones become more porous and spongy than normal; hence the name. The laity speak of it as Big-Head. The Germans call it Allgemeine Osteoporose. The Swiss name it Kruschkrankeheit.

Osteoporosis has been observed in England and Germany since 1860. It is more prevalent in the South than in the North. The reason for this variation may be due to the difference in climate. However, this has not been definitely established.

## CAUSES.

Damp impure air, insufficient light, imperfect drainage may predispose an animal to, or accelerate the activity of, this disease; yet they are not primary, exciting causes. Owing to the fact that some authorities (Friedberger and Frohner) classify osteoporosis as a variety of osteomalacia or rachitis, many persons are wont to attribute the cause to insufficiency of lime salts in the feed or water. Such reasoning seems to me to be defective, since the cause of osteomalacia or rachitis is still in the theoretical stage. Want of lime salts in proper condition or quantity may have much to do with this disease; yet this connection has not been established by experiment or otherwise. I have seen the disease among animals that lived on lime lands; and, in one instance, in a mule that was worked at a lime kiln where lime water and lime in various forms were accessible. An improperly balanced ration or insufficient variety of feed, if long continued, may play an important role in the production. This is illustrated by the many cases that have been produced by a constant diet of bran, or of corn as a single

food, especially during the growing period of the animal. Too much of the phosphates, too much of the proteids, too much of the fat forming feed, have been suggested as causal factors. Indigestion or mal-assimilation may be antecedent or consequent causal factors. The miasmatic or protozoon theory is yet vague and uncertain. However, the fact that osteoporosis occasionally presents infectious characteristics, corroborates, in a measure, this theory. Rheumatism is considered by many the real cause of osteoporosis. But what is rheumatism? Cold? Lactic acid in the blood? A micro-organism, or what? In many of the cases that I have observed rheumatic symptoms and lameness were very prominent. In some cases anaemia is more or less distinct, but whether this is a primary or secondary condition has not been determined. An hereditary tendency will usually strongly predispose the offspring to this disease. A stallion with osteoporosis is usually a poor getter of colts, and, if kept in service, does not live long. Mares with osteoporosis rarely live to bear a second colt.

#### SYMPTOMS AND COURSE.

Several hostlers and stock men have reported to me that the first indication of anything abnormal with a horse or mule was a slight fever; this, according to them, lasts from one to three days. In one to three weeks thereafter distinct lameness or enlargement of the facial bones appears. I saw one case immediately after the facial enlargement appeared. There was no systemic fever, but there was a mild local elevation of temperature at the place of the enlargement. I have also observed this local fever in osteoporosis enlargement of the limbs, especially in their early stage. This local fever may gradually disappear.

It is no uncommon thing to find indigestion and mal-assimilation more or less constant throughout the course of osteoporosis; acute indigestion, as a rule, appears periodically. In some cases, however, digestion and assimilation remain normal until the later stages of the disease.

As a rule, it requires from two to three months for the disease to become completely established—to involve a great number of bones and several articulations.



The superior maxillaries, the nasals, and the inferior maxillary are the bones that are usually first involved. However, many other bones may be involved at the same time or earlier; yet they may not be observed or can not be seen. The enlargement of the facial bones are always symmetrical; that is, both sides of the face are of equal size. The diseased facial bones in the early stages can be easily punctured with a needle or any slender, moderately sharp instrument. This soft, spongy condition may remain more or less constant during the life of the animal. In some cases where there is partial recovery, the compact layer of bone may be reformed and thus become moderately hard and resist the entrance of sharp instruments. The bones of the limbs are rarely if ever enlarged. The shoulder, the knee, the fet-lock, the stifle, or the hock may become larger than normal, but these enlargements are the result of synovial distentions and infiltrations into the periarticular tissues rather than enlargement of bones. A hog spavin may appear at the hock; or an occult articular bone spavin may appear, but rarely or never does a bone spavin with an exostosis appear in connection with osteoporosis. Lameness is a very common symptom. It is most frequently observed in the shoulder, the stifle, the hip, the hock, or the knee. It may be observed in the foot or the fet-lock. One characteristic of this lameness is that it is liable to shift from one limb to another, or from one region to another. The changing of the seat of the lameness, the synovial distentions and the periarticular infiltrations make this lameness very like what is termed articular rheumatism. The changing of the location of the lameness is usually more frequent in old standing cases. The seat of the lameness remains more constant and fixed in the early stages of the disease. Occasionally the lameness in the foot will simulate navicular disease. At the stifle there may be a large synovial dilatation with luxation of the patella. Lameness without apparent enlargement of the articulation is also common.

The inferior extremities of the ribs, near and at the union of the ribs with their cartilages of prolongment, may become enlarged. In many instances the ribs become so pliable that

they will easily bend when pressed with the hand or when the horse lies down. Should the horse lie down upon a rock or any small elevation, the rib region is liable to remain more or less indented. I have observed indents in the rib region six to ten inches in diameter, and one to three inches in depth. I have never observed a fracture in an osteoporosis case except of the ribs.

The direction of the croup usually becomes more oblique than normal. In some cases luxation at the ilio-sacral articulation may occur. The sacrum then drops downward.

In the great majority of cases progressive paralysis of the hind limbs is one of the later symptoms. This is due to pressure on the spinal cord or nerve trunks by the enlargement and change in the position of the bones. In such cases the animal is said to "break down behind;" it is unable to arise without assistance, and finally it can not stand when helped up.

#### POST MORTEM CONDITIONS AND PATHOLOGY.

The body of a horse or mule, dead from the effects of osteoporosis, exhibits an impoverished condition; the tissues and organs present a distinct anæmic appearance.

The periosteum, over recently involved cranial or facial bones, is thick and very vascular, and easily torn or removed from the bone. The recently enlarged facial bone possesses a pale pink or whitish color; it is soft and spongy and easily cut with the knife. The cut surface shows the bones to be made up almost entirely of spongy or cancellous bone tissue, having its meshes or cancelli filled with hypertrophied soft tissue and cells. Varnell reported that this soft part of the bone contained an extra quantity of fat cells. Macroscopical and microscopical examinations lead me to believe that there is less fat in the spongy tissue of an osteoporosis bone than in the spongy part of a normal bone. The facial bones are from two to three times as thick as they are in health. The enlargement extends inwardly as well as outwardly; thus decreasing the size of the facial sinuses.

In the long bones the compact tissue of the shaft is atrophied; decreased in thickness from one-fourth to one-half of its normal thickness. The outer circular lamellæ or bone

plates are rarely, if ever, removed; but the inner layers, or Haversian systems are removed in the direction of from within to without. This enlarges the medullary cavity, and makes thinner the wall of the shaft. The periosteum is not so readily torn from the shaft and is not so much involved as at the extremities of the long bones or as it is over the facial bones. The marrow is more vascular than normal and consequently is more like red marrow in color. The ends of the long bones are more like the facial bones. The compact surface layer is partially or entirely changed into spongy tissue and the cancelli of the normally spongy bone of the extremities become larger. However, it rarely is the case that the extremity of the bone becomes enlarged or distended. The lower ends of the ribs, the vertebræ, the pelvic bones, and sometimes the scapulæ, are involved similar to the facial bones, yet they are not always appreciably enlarged. The synovia in an affected articulation is large in quantity, thick and light brown in color; it contains the broken-down material from ulcerated articular cartilage and bone, and probably some leucocytes and blood corpuscles. The synovial membrane may be thicker and rougher than normal. Ulcers are nearly always found in the articular cartilage and they usually extend down into, and involve, the bone beneath the cartilage. Apparently the loss of substance in the cartilage is a direct result of the morbid changes in the bone beneath the cartilage. The tissues around the articulation may become infiltrated with a non-coagulating serous material. Rarely will the gelatinous infiltration be observed in the periarticular tissues as in articular rheumatism. Occasionally a ligament or a tendon will break its attachment by tearing the periosteum from the diseased bone. Such cases, however, are very rare. Fractures and sometimes false unions may be found in the ribs but rarely or never in any other bones.

The cause of the morbid changes in the bones is unknown. Likewise, the order, or course, of the pathological changes is very indefinitely understood. In the development of bone there is a stage in which spongy tissue occupies the place of compact bone tissue. In other words spongy tissue precedes

the development of compact and, in fact, forms the interstitial part of compact bone. The Haversian lamellæ are all removed in osteoporosis, leaving the interstitial tissue as trabeculæ, making veritable spongy tissue. This occurs in both the outer and inner plates of the flat bones. So far this process may be termed atrophy of the compact bone tissue. It may be concentric or excentric atrophy—most frequently the latter. In some instances or in some stages of the morbid process, only the internal Haversian lamellæ have been removed, consequently there is only a moderate enlargement of the Haversian canals. In fact the various degrees in the morbid process may be found in the different bones of a single osteoporosis case. In the shaft of the long bones and probably in some others, the inner layers of compact bone are changed into spongy tissue and the latter is then removed. Some of spongy tissue in or near the extremities of the long bones is removed, since the medullary cavity is appreciably enlarged in its transverse and longitudinal diameters in that part of the bone. There is another change that sometimes occurs; it appears to be a reparative process. This is most frequently observed in the facial region. A new layer of spongy tissue is developed under the periosteum and over the external surface of the bone. It may also be near the extremities of long bones and at the inferior ends of the ribs.

When partial recovery takes place, compact bone tissue is developed in the external new spongy layer, or it is formed in the spongy bone in which the healthy compact bone was located before the animal was affected with osteoporosis. The bone thereafter remains larger and heavier than it was in its normal state.

The changes that take place in the soft structures of the bone are said to be hypertrophy of the connective tissue, the vascular structures and the cellular elements. No doubt, there is an increase in the number of osteoblasts and the large multinucleated, bone-absorbing *osteoclasts*. The increase in the quantity of connective tissue would be secondary to the absorption of the Haversian lamellæ. And the increase in vascularity would occur as the compact bone

tissue was being changed into spongy. The fact is that changes that occur in the soft structures have not been thoroughly studied. In order to study these changes one should have fresh tissues of all the various stages.

The pathological changes point very decidedly toward an aberration in the growth of the bones that had originated in the developing period of the animal. However, there are many clinical cases that strongly contradict such a theory, the disease appearing after the animal had been completely developed.

#### DIFFERENTIAL DIAGNOSIS.

I. *Rheumatism*. Osteoporosis is more like rheumatism in its clinical manifestations than any other disease. It may be a variety of rheumatism that is peculiar to the horse and the mule. If the primary disease is osteoporosis, rheumatism early becomes a complication and remains a constant associate, or appears periodically throughout the entire course of osteoporosis. In old standing cases, periodic rheumatic attacks always occur. In such cases, rheumatic remedies usually give temporary relief.

II. *Odontomes—Carious Teeth—Pus Collections in the Sinuses*. Remembering the fact that the facial enlargements are always symmetrical, one need not mistake osteoporosis for any other facial enlargements, due to new growths, diseases of the teeth, or sinuses of the head. There is a disease of the developing permanent molar teeth, usually involving one or more of the first three upper molars on one or both sides, that occurs when the colt is from two to four years old. It seems to be due to the early shedding of the temporary teeth and to mechanical injury or infection of the membranes around the incompletely developed permanent teeth, finally resulting in necrosis of the bone, or the root of the tooth. If this disease occurs on both sides, the enlargements of the face are always unequal.

III. *Osteomalacia and Rachitis*. The former rarely or never appears in horses or mules, and the latter occurs only in young colts. These facts alone will usually separate them from osteoporosis. There may be some pathological resem-

blances between these diseases and osteoporosis, but the connection does not seem to be very close.

IV. *Bran Disease*. This disease appears in millers' horses that are fed almost entirely on bran for indefinite periods. Without doubt, this is true osteoporosis. In this country bran is not fed to horses or mules any length of time, consequently does not bear any special relation to osteoporosis.

V. *Millet Disease*. In this disease there is some resemblance to old standing osteoporosis cases without facial enlargement. In fact I have never observed true facial enlargement in millet disease. The articulations may be similarly affected, but otherwise there is no distinct resemblance between the two diseases.

#### TREATMENT.

*Preventive*. Variety in rations, especially for colts, is one of the prominent requisites. Well balanced rations, proper ventilation, drainage, light, cleanliness and proper care in all ways will aid in preventing osteoporosis and many other diseases.

The breeding of animals that have osteoporosis can not be too strongly condemned.

*Curative*. Mercuric iodide, cantharides, arsenic, and many other drugs have been applied in the form of blistering preparations to the local enlargements. Actual cautery has also been used. The results have been variable. In some cases I have observed local improvement. However, such improvement is only temporary. It is possible that sharp blisters applied to osteo-rheumatic articulations may be of some value.

The internal use of salicylic acid or salicylate of soda and nux vomica has brought about favorable results in many cases in my experience. As a rule, these cases were old ones having a rheumatic complication. In such cases, I have obtained excellent results with weekly intravenous injections of barium chloride. I think the same remedy, given per mouth once or twice per week, will give equally good results. This remedy purges the animal and stimulates the voluntary and involuntary muscles, and possibly the excretory glands. Tonics and a run at pasture will do as much for a case of

primary osteoporosis as any other form of treatment. Phosphate of lime, lime water, ground bone, bone ash, have been tried and in some cases proved to be valuable. However, I have never obtained any good results from the use of them. The fact is that well established cases of osteoporosis can only be temporarily relieved.

I have a record of fifty-seven cases of osteoporosis. Of these two were known to have osteoporosis at 1 year old; four at 2 years old; four at 3 years old; two at 4; four at 5; seven at 6; three at 7; one at 8; one at 9; one at 10; and one at 12 years old.

The ages of these fifty-seven cases, at the time I saw them, will vary from 1 to 20 years. Thirty of them were under 10 years. As far as I could determine from the history obtained from the owners, it took from two weeks to three months for the bony enlargements to develop.

Of these cases, twenty were geldings; eight were mares; four were stallions: eleven were mules.

Twenty-five of these cases presented a distinct rheumatic complication, and one case was also a "dummy".

In only one instance did I observe any indication that osteoporosis was infectious. In that instance there were six cases in one drove of mules.

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## DISCUSSION.

Dr. Wheeler: I would like to ask Dr. Cary the cause of bran disease. What little experience I have had in the disease in New Orleans, principally in the fire department, where the horses were spread all over the city, about one hundred and twenty-five to one hundred and fifty horses scattered all over the city, in lots of three or four, and I saw some osteoporosis among the horses; more osteoporosis among the fire department horses than all the rest of the number put together, but whether or not I could correctly ascribe that to the feeding of bran I don't know; but they were great believers in feeding bran, and I did not have the feeding of the stock sufficiently under my control to be able

to experiment along this line. Another question I would like to ask him is, how many cases of mules he has seen that have been reported to him?

I had in my practice in New Orleans, which is largely a mule city, most of the traffic being done by mules, unmistakably one well marked case of osteoporosis.

Dr. Cary: I have, I think, reported eleven cases in mules out of fifty-seven. In regard to bran disease, I will say I never saw a case. I rely almost wholly on the descriptions I have read in Berlin, and also the German and Swiss works. I couldn't say positively, but from the description I think the two are identical.

Dr. Wheeler: You didn't catch my idea in regard to that being the identical cause. Is there any scientific proof that the bran is the cause of the bran disease?

Dr. Cary: No, there is no scientific proof.

Dr. Fennimore: I should like to hear more from the gentleman on the infectious nature of this disease. I had what seemed to be an epidemic of it in 1892, and it lasted for about six months. Some of the cases died, and others recovered. Then it entirely disappeared for two years. It came again in 1894, and it was a great deal more severe than it was in 1892. In the outbreak of 1894, the cases that recovered in 1892, almost to a case, had the disease again, and when they had the second attack it killed them. Almost all of them died in this way.

Mr. Cockerell: I have never seen occurrences except in seasons of abnormal climatic conditions. I would ask these gentlemen, who have more opportunities to know than I have myself, if they have not found a close connection with the abnormal condition of the food that these horses have eaten, grown under adverse conditions, or with growths of smut and of ergot, and different kinds of growths?

Dr. Bell: What I may have to say can only refer to the physical aspect of the disease, as I have not gone into the study of the pathology or bacteriology of it. I come from a state that is noted for the prevalence of this disease. Some two years ago a large breeding establishment of thoroughbreds had to remove from Long Island. The animals would



grow up to very promising two-year-olds, worth fabulous amounts of money, and in their three-year-old form would have to be discarded, on account of this disease. The growth of these animals was largely forced, in order to produce the maximum of vigor and strength. At so young an age, the exercise was taken in hot days during the winter months. Looking at it in the clinical aspect, and replying, somewhat, to the observations of Dr Fennimore, as to the infectious nature of it, those of us who have had experience in that locality have not been able to regard it as an infectious disease, but we have all recognized that at certain times of the year, or biennially, it is in greater abundance than at other times. We have frequently seen one stable containing a number of cases. We have also seen a stable having but one horse having successive animals bought to replace those destroyed with the disease, each becoming affected in its turn.

Dr. Rechtenwald: In one place I had a horse destroyed about five years ago; another one in four years, and then I had the stable whitewashed, and the disease has not occurred since. In another large street car stable we had the same trouble. We lost seven horses in one year. That place, however, seemed to be the best ventilated, and the finest stable in the lot. There were three other stables, badly ventilated, and we had no cases in them.

Dr. Hoskins: This is a subject which has grown of so much importance to every routine practitioner that I think it is quite time that those states which have had money appropriated for investigation to turn a good share of it to work in the line of investigating the cause and the true character of this disease. One of the previous speakers referred to the stable where the conclusions of the veterinarian were that the sanitary conditions were such as probably to have been a generating factor. There are just as many cases, one of which I will recall, in particular, of a stable built on the best sanitary principle possible, that it is impossible for us to put a new horse in there during the last six years without his developing osteoporosis in from three to eight months. We keep four horses there, and we are

never without one with osteoporosis. When he gets pretty bad, we have to abandon him and buy a new one, with the same result. Another case in particular came to our attention and observation; that of a pony that I purchased for my children. It had never been harnessed until about five years of age. That pony went from 157 pounds, at the time of the purchase, up to 264 pounds in a period of eight months, and when it seemed to be just in the pink of condition commenced to develop an obscure lameness. This pony died with osteoporosis, with one of the largest heads I ever saw. It was kept in one of the best possible stables. There is light, perfect drainage, ventilation, and we are able there to disinfect perfectly, and do regularly every week, everything that was there about this pony as well as the other animals of the place. I am of the opinion that there is something in the method of feeding, or there are times when the food products are conducive to the development of this disease, or there are places where food products are delivered from that seem to give to that food a disposition to produce osteoporosis.

Dr. Wheeler: I would like to ask the doctor what character of food that pony was fed on?

Dr. Hoskins: Crushed oats and bran liberally, and allowed no whole oats; occasionally got a small portion of hominy meal, with grass and hay.

Dr. Wheeler: You did not examine the locality where they were grown, and investigate as to the season and conditions under which they were grown?

Dr. Hoskins: The food came from different sources. I have made it a point of not buying my food from any one dealer. I have never had any other case developed in my sanitarium.

Dr. Wheeler: I have never seen a case where I investigated the food supply that the animal had not received bran; they may have received oats and hay also. We have a committee already appointed to investigate tuberculosis, a subject of vast interest. Why not appoint a committee to investigate the subject of osteoporosis, a subject not of course of equal, but certainly of very great, interest? I know when commit-

tees are appointed one most generally does all the work, but I think it will be a stimulus to the Association to have a regularly organized committee to investigate osteoporosis and various other diseases.

Dr. O'Connell: I live in the Connecticut valley, in Massachusetts, and I do not remember in twelve years' practice of ever finding a case of osteoporosis. I would like to ask the essayist how long from the time the animal begins to show the disease do the enlargements appear? Do they appear at once, and is that one of the most prominent symptoms?

Dr. Cary: I have not been able to test a case in the incipient stage, but from the reports I have received, it takes from two to six weeks—possibly an average of four. There are some cases that may run eight weeks.

Dr. O'Connell: Is the animal sore? Does it seem to be an exertion for him to move? Does it hurt him and does he groan?

Dr. Cary: In some cases he is extremely sore, while in others nothing but the facial enlargement is seen.

Dr. O'Connell: Does damp weather seem to have any effect?

Dr. Cary: I think damp weather intensifies the effect, especially if there is any rheumatic complication.

Dr. O'Connell: Do enlargements ever appear in front of the nose, and round that out like a Roman nose?

Dr. Cary: You will see in this specimen the enlargement extends all over the facial and cranial bones; even the body of the occipital bones.

A Member: I think this enlargement is misleading. My experience is that we have an enlargement in young but do not have in old horses. I have had lots of cases of osteoporosis where there is no enlargement at all.

Dr. White: I have had experience in osteoporosis in Missouri. I find cases without enlargement and with the enlargement. I have seen it in old stables and newly constructed stables, but I have, I think, always been able to trace it to some old well or old cistern. I had an outbreak this spring, where the barn had been rebuilt, but they were

using the water in the cistern from the old barn. This was a breeder of thoroughbreds, and all of his two-year colts had the disease in various forms. I have seen an outbreak in jacks and jennets and every time they have been using water from old wells and from old cisterns, and I have an idea that there might be something in the water supply.

Dr. Mitchell: This discussion has brought to mind a series of circumstances, I had previously attached no importance to. A few years ago, a gentleman embarked in horse breeding—especially Shetland ponies—purchasing for that purpose a tract of land from one of our large land-owners and breeders. The tract purchased had previously been used as pasture and to my knowledge had not had a case of the disease, but the new owner introduced several ponies affected with osteoporosis and from that time there has been more or less of it seen, in the ponies, trotters and the work horses. The original owner, just across the fence or party line, has not been troubled with it. The feed used was purchased in car lots from different places, and fed in the city dray stable of the firm, as well as on the farm, yet I have never seen a case of it in the city stable. I have always been skeptical as to our ability to transfer it from one animal to another, and have never thought of this case in that light, but since hearing the discussion, the peculiar circumstances, and the affection of one animal after another following the introduction of the diseased ponies, certainly leans a little to the infection theory.

## THE NEED OF VETERINARY EDUCATION IN MEDICAL COLLEGES,

BY DR. E. P. NILES.

MR. PRESIDENT AND GENTLEMEN: Upon giving the subject but a passing thought it may seem to some of you that veterinary education in medical colleges is of but little, if any, importance, and a large number of the medical fraternity may ask: What do we care for a knowledge of the diseases of the lower animals? In answer to the latter I would ask: How many lives could you have saved had you but known the source of certain contagious diseases which you have treated in your practice? The idea of employing a veterinarian as a member of the faculty of a medical college seems to have given cause for but little thought, even to the present day, and I know of but one institution which has established a chair of comparative pathology—the University of Buffalo. Until recently it could not be wondered at that more importance was not attached to veterinary education by our medical boards, for we have been laboring in our infancy. We are rapidly securing state laws in the advancement and the elevation of our profession. Our colleges are increasing their curriculum and teaching forces. We are gaining the standing of professional men instead of the common every-day “horse doctor.” In fact we have become educators instead of a drag upon educators. Therefore, let us educate the public and our medical boards, to the importance of this branch of science.

Too often a physician is called in to treat an infectious disease of the human family and contents himself with making a simple diagnosis and after leaving directions as to treatment departing without making an effort to trace the source of the disease. Can we call this negligence on his

part? I hardly think so, for had he been taught comparative pathology at the college which he represents he would have known the importance of looking outside of the patient's house for the origin of the disease, and, in all probability would not have left his patient until he had made a thorough investigation. The blame then rests upon the college and not on the physician.

There are several reasons why a veterinarian should be employed as a member of the faculty of medical colleges. A successful physician must be a good sanitarian. He must be able to prevent disease as well as to cure. He must be educated to know the value and importance of veterinary science. He must be educated to the importance of the appointment of a veterinarian on sanitary boards. He must be impressed with the fact that the two professions are closely related, and for the public welfare must go hand in hand. He can only be so educated at the hands of the veterinarian.

A few years ago it seemed to be a matter of little importance whether a physician knew any thing of the infectious diseases of the lower animals or not, but since the researches in bacteriology have opened up a comparatively new field of science we are forced to admit that contagious and infectious diseases are due to a specific micro-organism and that certain micro-organisms are capable of causing disease in both the higher and lower animals. In many instances, however, the manifestation of disease may be so modified in the lower animals as to render it impossible for the physician who has had no training in comparative pathology to make a correct diagnosis; the physician in such cases failing to do his duty to his patients for the want of proper training. It would seem that certain branches of the medical science were degenerating, although rapid strides have been made in certain directions. I refer particularly to the lack of interest shown in comparative pathology. In the beginning of the eighteenth century, when but little was known of veterinary science, Fleming states that eminent physicians devoted all their energies to the advancement of comparative pathology. These energies seem to have been peculiar

to our forefathers, for where have we to-day, with the exception of about three universities, a single individual, outside of the veterinary profession, or an institution manifesting any marked interest in comparative pathology?

Our colleges seem to have drifted into a narrow channel which year by year becomes deeper and narrower, and from which it is difficult to extricate them. Medical men not having their attention called to the importance of having comparative pathology taught in their colleges have lost sight of the early efforts of the medical profession and are content with a knowledge of human pathology alone. They do not realize that their sanitary boards would be much more efficient, and that they themselves would gain a much more prominent position in their community as public benefactors. With men who have been trained in comparative pathology as members of boards of health, diseases of the human family will be more effectually controlled. The importance of legal recognition of the veterinary profession will be more fully appreciated and the appointment of a qualified veterinarian on all such boards will result. New positions for veterinarians will be created and our profession will advance still more rapidly than it now does. Sanitary boards will become more than mere statistical collectors. Legislators will soon see the importance of providing such boards with sufficient funds with which to prosecute the work of controlling and stamping out contagions and infections. In fact, these boards will become investigators and advisors.

The physician of this day and age should, to a certain extent, be an investigator. He must know comparative pathology.

Beginning with the earliest history of medicine we find that the physician at that time gained a greater portion of his knowledge of medicines by experimentation upon the lower animals. His knowledge of the anatomy of the human body was gained only by a most superficial examination of the carcass of a dead animal. He noted the arrangement of the organs and their connection with each other, and took it for granted that the organs of man must

bear a close relation to those of the lower animals and that their functions, and relation to each other must be similar. He based his principles of the treatment of disease of man upon this crude knowledge of physiology and anatomy of animals. In those days experimentation upon man and the dissection of the human body was practically impossible, and it became necessary for the physician, to a certain degree, to study veterinary science to obtain a practicing knowledge of medicine.

Human subjects are more easily obtained at present, hence the anatomy of man may be studied without the aid of the lower animals. But not so with medicine. Here we still find it necessary to avail ourselves of the opportunity for study offered by animals.

Actions, uses and doses of new drugs are thus obtained. Antidotes for poisons are thus discovered. Antitoxines are discovered, and from them obtained for the treatment of disease in man. Similarity and identity of disease of man and animals is observed, and as animals furnish a very large proportion of our food we are beginning to realize more fully than ever that the source of some of the most fatal diseases of man are to be found in the lower animals.

If the two professions, so closely related, yet in many respects so far divided, were marching along more nearly hand in hand both would be bettered; both would become more successful; both would advance more rapidly; the physician would become more nearly an ideal public sanitarian, and every patient visited by him would be made to feel that he was truly in the hands of a good Samaritan. Hundreds of lives would be saved annually as a result of the practical extermination of preventable diseases.

Here then, we find it necessary for the physician who would prevent the spread of disease, for example, tuberculosis in the human family, to have a sufficient knowledge of the disease in the lower animals to be able to advise his patrons in that direction; for what good is there in attempting to check the ravages of contagious diseases in man if man is to continue to be exposed to the same disease in the lower animals?



Therefore, a physician can but practice preventive medicine imperfectly without first having had the proper training in both branches of the medical science.

A veterinarian as a member of the faculty of every medical college is, therefore, indispensable in this day and age, and while we are making rapid strides in so many other directions let us not lose sight of the importance of agitating this question.

#### DISCUSSION.

Dr. Gill: Dr. Smith has been appointed to the Chair of Comparative Pathology at Harvard.

Dr. Hinebauch: Dr. Sayre, of Chicago, has been lecturing in Chicago during the past year on Comparative Pathology.

## INHALATION PNEUMONIA,

BY DR. W. L. WILLIAMS AND DR. P. A. FISH.

The inhalation of foreign bodies whether mechanical, chemical or bacterial tend usually toward bacterial invasion of the bronchial mucosæ, extending thence to the deeper parts, finally involving all tissues of the lungs, inducing supuration, necrosis and death.

The symptoms vary greatly in detail, though in general present the ordinary signs of bronchitis and pneumonia, along with expectoration of fetid bronchial secretions with such variations in chest sounds as would result from the presence in the tubes of the foreign bodies inhaled or of the products of disease.

The most common causes are the inhalation of medicines during their forced administration, of food particles during coma, as in parturient apoplexy of the cow, of pathogenic organisms and their products after arytenectomy for the cure of laryngismus paralyticus in horses or other operations involving the upper air passages, by the inhalation of pus discharged into the fauces or upper air passages from abscesses, diseased teeth or tumors, by animal parasites in the air passages, by the inhalation of irritant gases, or hot smoke, or of liquid chloroform during the production of anæsthesia, and by a great variety of more rare accidents ending in the lodgment of irritant foreign bodies within the air passages.

We might include also a highly important class of infections like diphtheria, in which there is a tendency for the extension of the lesions to the lungs, or of tuberculosis, actinomycosis and glanders, where there frequently occurs necrosis and softening of patches of lung tissue, which discharging into the bronchi, tend to pass upward only to be

in part carried backward into neighboring bronchi, establishing there their typical pathological processes in that manner commonly termed auto-infection.

The handling of these cases has, as a rule, proven ineffectual, and led practitioners to recoil from them with well founded dread.

The plan of treatment usually adopted has consisted of the internal administration of expectorants and sedatives with some of the gum-resins possessing antiseptic properties, and which are largely excreted by the lungs, and the inhalation of vapors either simple or medicated.

Intra-tracheal injections of vermicides have been successfully employed in verminous bronchitis, and the bronchial mucosa has been used as a prompt and reliable absorbent surface for the administration of various drugs in solutions of small volume. The senior writer has attempted the administration of antiseptics in small volumes by intra-tracheal injection in cases of suppurative bronchitis, and has endeavored to aspirate suppurative areas of the lung and inject the cavities with antiseptics, but without noteworthy success.

Beaumont Small (Handbook of Med. Sci. IX, 756,) employed a 1 to 500 solution of pyocetanin in form of intrapulmonary injection of 8 to 16 minims in pulmonary tuberculosis, which was reported well borne, except that when reaching the bronchi it caused violent coughing, but was said to have lessened the hectic condition and diminished the number of bacilli in the sputa.

We have been unable to find record of any attempts to administer per trachea for therapeutic purposes, large volumes of liquids either as mechanical detergents or as topical or general antiseptics, the filling of the lower air passages with liquids being associated in the popular mind with drowning.

Opposed to this fear existed the well known fact that in partial drowning the water which had well filled the air passages was in many cases partly drained out, largely absorbed, and the patient left little worse for the experience beyond the physical shock.

It had also been shown experimentally that large quantities of water could be slowly introduced into the lungs through the trachea and become absorbed without untoward results, while a like volume introduced rapidly and persistently would produce profound disturbance and eventually death. Notwithstanding that absorption occurs more rapidly in the lungs than elsewhere in the body, excess of fluid effects material changes, not only in the respiratory epithelium, but also in the blood, in which any change must necessarily effect all other tissues.

In an experiment at Lyons, France, under the direction of Gohier, 30 litres (7-½ gals.) of water were injected into the trachea of a horse without causing death. In another case it required 40 litres (10 gals.) to kill the animal by suffocation. Colin (1873, Vol. 2, p. 109) experimenting along the same line, introduced into the trachea of a horse by means of a special apparatus, 6 litres of water per hour at a temperature of 30° to 35° C., which was continued for three and one half hours, making a total of 20 litres, after which the animal was immediately destroyed, the bronchi quickly opened, but found empty, all the water having been absorbed.

In another horse he introduced into the trachea 25 litres of water in six hours, and bled him three times at intervals of two hours, obtaining 6 kilogrammes (13 2-10 lbs) of blood. The respiratory mucosa absorbed all the water without apparent inconvenience to the animal.

Intra-tracheal medication, though not in general use, has much to recommend it when rapid effects are desired, especially in those pulmonary diseases where antiseptics are indicated.

Among the agents best adapted for this use, is hydrogen peroxide, which is antiseptic, non-toxic, deodorant, styptic, and in dilute solution non-irritant.

With these facts and suggestions before us, two cases were presented at the clinics of the New York State Veterinary College, which served to invite more radical attempts at intra-tracheal medication than had previously to our knowledge been undertaken, the results of which were to us

at once so unexpected and instructive, that we felt ourselves warranted in communicating them to the profession, though admitting that our experiments were preliminary and quite incomplete.

Case I was an adult roadster gelding, vigorous and sound so far as known, except well marked laryngismus paralyticus, on which account he entered the clinic for the removal of the left arytenoid cartilage. After careful dieting he was cast for the operation on June 3rd. General anaesthesia was omitted and cocaine used to produce local insensibility. A tracheotomy tube was inserted some twelve inches downwards from the larynx, after which the arytenoid cartilage was excised in the ordinary manner by the senior author of this paper. The patient fought viciously throughout the operation, and the day being warm he became very hot and bathed in profuse perspiration.

The operation completed, the tampon trachea tube was inserted and the operation field tamponaded with absorbent cotton and iodoform.

On June 4th the tampon and canula were removed, the operation field carefully sponged with 1-1000 sublimate solution, and the horse was permitted to drink a goodly quantity of milk, which he apparently relished. From this time until June 10th the patient seemed bright, drank liquid food with avidity, temperature was normal, and all appeared well except an abundant and ever increasing fetid purulent discharge from the nostrils and tracheal openings.

On June 10th he appeared weaker and had fallen down but was quickly assisted to his feet, and the fetor of tracheal discharges still increasing, we injected small quantities of hydrogen peroxide into the trachea which caused the discharge of some froth.

On the 11th well defined suppurative broncho-pneumonia was noted, the patient was rapidly failing, and the area of disease was so great that the intra-tracheal injection of small volumes of antiseptics could promise no benefit. At this juncture Professor Law suggested that as an experiment on a hopeless case, we might, in light of the experiments noted above, attempt the administration of antiseptics by

the intra-tracheal injection of large volumes of liquids and permit them to be absorbed from the pulmonary mucosa. We prepared a tepid solution consisting of 5 litres of water, 30 grammes sod. chlor. and 60c. c. of the commercial solution of hydrogen peroxide.

Placing this in an irrigating reservoir at an elevation of 10 feet above the animal, with the liquid gravitating downward through three-eighths inch rubber tubing and escaping through a one-fourth inch nozzle, the latter was inserted in the tracheal opening and the liquid allowed to flow into the trachea in a full stream until about one litre had entered, when by an expulsive effort the greater part was thrown out through the tracheal openings, mouth and nostrils, the liquid emerging frothy, and carrying with it fetid discharges. As soon as that which had been thrown into the trachea was well out the process was quickly repeated until within ten minutes the entire five litres of liquid had passed into the trachea, the greater part of it having been thrown out, again carrying with it much putrid material.

This was accomplished without apparent distress to the patient, causing only a moderate amount of coughing with each expulsive effort, and leaving him at the conclusion of the ordeal apparently without additional fatigue and with the fetor of his breath very effectively diminished, his air passages clean and to all appearances the local conditions materially improved. The patient died on the following day without our having repeated the treatment, and the autopsy showed extensive necrotic broncho-pneumonia.

The only result gathered from the case was the facility with which large volumes of liquids could be rapidly introduced into the trachea without producing inconvenience to the animal worthy of remark, at the same time thoroughly flushing out the air passages and measurably deodorizing and disinfecting them.

Case II was in all material respects like I. Operated upon on June 4th this year, in the same manner as No. I, by student H. The patient struggled less violently than I and was less fatigued after the operation.

Tampon and tampon canula applied as in I, and removed on following day.

Deglutition very imperfect, almost all fluids taken into the pharynx being expelled through the nostrils and tracheal openings.

From June 6th to 12th the loss of power of deglutition continued unabated, and there were no notable changes except that gradually increasing fetid discharges took place from the nostrils and tracheal and laryngeal openings. By the 13th of June the patient had become exceedingly weak, having been practically without food either solid or liquid, for nine days. At this stage the tracheotomy tube which had been removed on June 6th was replaced as a precautionary measure, and the patient allowed to eat succulent grass and soft bran and linseed mashes, of which he partook sparingly, much of it dropping out through the laryngeal opening. By June 17th the breath had become very fetid, which on the 18th had become excessively stinking.

An examination of the tracheal wound revealed a necrotic piece of cartilage which was excised. We then introduced into the trachea 5 litres of tepid water, with 30 grammes sod. chlor. and 60c. c. solution of hydrogen peroxide, which flowing in rapidly was largely expelled, flushing thoroughly the air passages, pharynx and surgical wounds, cleansing and deodorizing the parts.

On the 19th the fetor seemed so much less that the irrigation was omitted, but on the 20th the fetor had increased and the lungs were again flushed out like on the 18th, without inducing any marked discomfort. The intra-tracheal treatment was now discontinued.

After this the patient seemed to improve slowly if at all, in strength, appetite and power of deglutition, and was greatly harassed by a persistent cough. The tracheotomy tube was removed on June 25th, as the power of deglutition now seemed restored, and by July 14th the tracheal and laryngeal wounds had closed, but the cough continued, the patient remained emaciated and weak, the appetite indifferent, the breath had again become fetid, especially evident during his fits of coughing, during which he expectorated through the

mouth or expelled through the nose dirty gray very fetid discharges. As there was evidently still some serious pathological condition present, we reopened the laryngeal and tracheal wounds for examination, finding each completely healed and all adjacent parts apparently normal.

We had barely completed our physical examination of the parts when in a fit of coughing he expelled through the laryngeal incision an excessively fetid, dirty, grayish tenacious mass, which it could now be no longer doubted had emanated from low down within the bronchi and indicated local purulent broncho-pneumonia.

We then began anew the irrigation of the bronchi, the volume, composition and mode of administration of the fluid remaining the same, and being repeated daily.

On the 15th we began the internal administration of quinine sulphate *dr.*, nux vomica *grs. xx*, and arsenic *grs. ii*, twice daily.

At the first expulsive effort during each irrigation, the patient expelled with the water about 10c.c. of a dirty gray, very fetid, tenacious discharge, and on July 17th he expelled a piece of fetid necrotic tissue estimated to weigh two grammes.

On July 18th the volume of water was reduced to 3 litres, the sodium chloride correspondingly, leaving it at 6 per cent., while the volume of hydrogen peroxide was left unchanged.

On July 19th five days after the beginning of the regular daily irrigations, the fetor of the expectorated mass had greatly diminished, while its color had changed to almost that of ordinary mucus.

July 20th no fetor could be detected in expectorate, nor in expired air.

July 26th the hydrogen peroxide was doubled, which caused more coughing and resulted in increased discharge of bronchial secretion on the 27th and 28th, though the hydrogen peroxide had been reduced on the 27th to the original amount and was so continued thereafter.

By July 31st the patient had markedly improved in every way, was gaining rapidly in flesh, the cough was less frequent, the bronchial discharge less, and seen practically only



at times of irrigation, and the animal would run and play in the paddock.

The use of the tracheotomy tube, through which injections were made, was dispensed with on July 30th, and the nozzle of the injecting tube inserted directly in the trachea with an apparent advantage in causing less coughing.

On August 2nd the patient had so far recovered that treatment was discontinued and the tracheal wound permitted to close.

August 7th he was hitched to a buggy and tested at a rapid pace up a steep hill, and found apparently much improved in wind.

On August 12th he was driven home, a distance of twenty miles, without showing signs of fatigue. On August 31st the owner reported the patient much improved in flesh, practically free from cough, almost free from respiratory difficulty when driven rapidly, and taking exercise work daily without fatigue or other difficulty.

While our experiments were very limited in extent, and can be regarded only as preliminary and suggestive, some facts have been established which appear to us of interest.

It has been shown that large volumes of water can not only be introduced slowly into and absorbed from the lungs, but that such quantities can be introduced into the trachea and bronchi at a rapid rate, if the trachea is open, and be thrown back through trachea, larynx, pharynx, mouth and nostrils, thoroughly flushing these parts, constituting thereby our most efficient cleansing procedure. We have shown that the air passages tolerate quite well at least one antiseptic, hydrogen peroxide.

Of great interest it appears to us, is the fact that on July 17th, during our irrigation we flushed out a large sized piece of necrotic tissue which must have been lodged low down in the bronchi. In each case we apparently cleared the bronchi, at least the larger ones, of any foreign matter, and we certainly are warranted in believing that the irrigation of the lungs exerted a very favorable influence on the course of the disease.

Our efforts suggest a much wider range of usefulness. In

accidental inhalation of drugs during drenching, it seems that irrigation may in safety be depended upon to wash out oils, to dilute and wash out such irritants as alcohol, turpentine, whiskey, chloral, etc., while in case of foreign bodies of considerable size, it offers us a means for their removal, quite worthy of a trial. It seems quite possible that good results might be had by this plan in such affections as pulmonary tuberculosis where large softening areas communicate with, and discharge into bronchi, and in all forms of suppurative broncho-pneumonia, and possibly also in extensive diphtheritic invasion of the air passages.

Perhaps one of its most direct uses will be found in the prevention of inhalation pneumonia after arytenectomy, as it affords us not only a safe plan for thorough irrigation of the field of operation, but the fluid passing down the trachea into the bronchi flush out and destroy any pathogenic organisms which have been inhaled.

We do not say that our plan, formula or rate of administration is the best, other antiseptics may be better and other rate or details of administration may be far superior.

We do not know if it is better to have a tracheal or laryngeal opening or not, though the absence of a counter-opening might, it seems to us, lead to dangerous spasmodic closure of the larynx.

The rate of administration can evidently be varied. We did not know at the beginning of our experiment the rate of administration by the experimenters quoted, and departed widely from their plan by introducing the liquid at a very rapid rate, quite too rapid to permit of total absorption, and in that way learned that we could, without discomfort or injury, have it quickly expelled, and thus we learned by comparison with Collin's and Gohier's experiments that we may at our option, by varying the rate of administration, either have the liquid absorbed or rejected, or partly absorbed and in part expelled. At some time we apparently had 50 per cent. or over absorbed, though always given rather rapidly, while in other cases nearly all appeared to be rejected.

We have been led to hope that in spite of the meagre

experience upon which we have based our communication, the facts and suggestions will suffice to lead others to study the plan of treatment herein outlined, with a view to developing a successful method of therapeutics in this heretofore baffling group of affections.

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### DISCUSSION.

Dr. Gill: As is the custom in the majority of schools to introduce into the trachea, water and irritants of all sorts to bring about pathological conditions whereby physical sounds could be caused, we were struck with the fact that the lungs would absorb a great amount of fluids. For example, we have introduced into a horse, a great deal of water, killed the horse, and found a great amount of water was absorbed. Then again, if you remember we had considerable tetanus, and I injected quite an amount of anti-tetanus. In one or two cases I introduced it through the trachea with very good results and Dr. Ackerman can bear me out in this. I say this to bear out Dr. Williams, that water is very readily absorbed, or in fact any medical agents. In using eserine, for example, in school, we always introduced it into the trachea and thereby get better results. The amount of tetanus serum I introduced into the trachea was about 300 c. c. I had an idea if it was blood it would be readily absorbed, and it was absorbed.

Dr. Mitchell: Mr. President, I would like to ask Dr. Williams if the opening both in the trachea and larynx had closed? I would like to know what method he had of introducing the quantity of water, or am I mistaken in the matter?

Dr. Williams: Mr. President, the gentleman is mistaken. The openings had closed, but were re-opened for examination.

## RABIES,

BY DR. A. W. CLEMENT.

Perhaps the greatest foes to scientific progress are those who possessing a certain number of facts, have added to them with unquestioning simplicity a large amount of fiction, and have thence deduced conclusions plausible indeed and appealing strongly to the popular mind, but which are not in accordance with first principles.

It is probable that the very fact of the abundance of our literature upon the subject of Rabies, has done more than anything else to bring up the question which one hears, nowadays, so often discussed both by the profession and the laity, whether Rabies is a genuine disease, or whether the cases which are reported as occurring in man are simply the results of certain nervous disturbances caused by anxiety and fear following upon the bite of an animal that has been said to have been mad.

Undoubtedly the cry of "mad dog" is enough to produce hysterical symptoms in a nervous person, and we can easily imagine that the bite of a dog supposed to be mad might produce such an aggravated form of hysteria as to result fatally.

But with Rabies in man I have nothing to do to-day, and hysteria in animals, though it undoubtedly exists, will not account for certain well-defined symptoms, which undoubtedly follow the bite of an animal which has presented a similar clinical picture. This much then, I think can be said with certainty, that there exists an acute disease of animals which can be communicated by inoculation, and to the disease characterized by this group of symptoms we may for the present, at least, be satisfied to apply the name Rabies.

The disease is dependent upon a specific virus, though up to the present time we are unable to say anything of the nature of this virus. We have never isolated any organism which has been proven to be the cause of the disease.

As to the distribution of Rabies, the disease is much more common in some countries than in others, and its prevalence seems to be in direct proportion to the efficacy of the laws relating to the proper control of dogs. Thus in North Germany the disease is rare, while in Russia it is quite prevalent, and in France and England it is not uncommon. In this country most of our best authorities have considered it very rare and up to within a quite recent period I myself had been inclined to agree with them.

Now, gentlemen, I must admit that I have changed my mind. I am convinced that I have seen in my practice several cases of undoubted Rabies, and I believe that you will agree with me in the deductions which I shall make from personal observations to be cited further on.

This disease is one of which we know very little, though the newspapers possess an abundance of detailed knowledge upon the subject, which they give to the public free upon application.

The clinical picture has not often been presented in other animals than man and the dog, and except when there is a reliable history of inoculation I admit that in most animals it is quite impossible, unless one has had especial opportunities of observation, to differentiate between this specific disease and other affections presenting somewhat similar characteristics. Close observation will, however, I believe, enable us to detect a similarity in the symptoms of the disease as it occurs in several species of animals and in man. The symptoms in human Rabies as laid down in Osler's Practice of Medicine are, first, premonitory stage; second, furious stage; third, paralytic stage. The symptoms in the premonitory stage consist essentially of nervousness, depression, sometimes slight difficulty in swallowing, husky voice and slight rise in temperature and pulse.

The furious stage is characterized by great excitability and restlessness, and an extreme degree of hyperaesthesia, any

external stimulus causing a violent reflex spasm. These spasms affect particularly the muscles of the larynx and the mouth, and are accompanied by severe opisthotonus. The paralytic stage is marked by hebetude and gradual unconsciousness, the heart's action becoming more and more feeble, until death occurs by sincopy.

Sometimes in animals the first two stages are omitted, as is the case generally or always in rodents, and apparently only the paralytic form known as ~~dumb~~ Rabies occurs.

The existence of the so-called dumb form alone is probably only apparent, the two preceding stages being so mild in character as to pass unnoticed.

As I said before it is only lately that I have changed my mind as to the extent of Rabies in this country, and I was almost obstinate in my refusal to believe in its relative frequency. For full details as to my conversion I would refer you to a short article published in the "Journal of Comparative Medicine and Veterinary Archives, May, 1897," entitled "Rabies in Sheep with Inoculation Experiments on Rabbits." The biological examination was made by Dr. Stokes, the city bacteriologist, in my presence, and the technique was such as to exclude other infection. The general history of this outbreak was as follows: A gentleman had lost several steers from some disease unknown to him, the symptoms of which he described, as first lassitude, weakness and a disposition to get away by themselves. They would neither eat nor drink. After two or three days they seemed to lose control of themselves, staggered, became very vicious and died. He said that a mad dog had passed through the place, a little while before, but I told the owner that I thought we would have to look elsewhere for the cause.

I made an autopsy on a steer which had died that morning (I had not seen any of the animals sick) and found no gross lesions. I took specimens of the blood and organs to Baltimore, expecting to find the cause of disease upon bacteriological examination. The bacteriological test however gave negative results, and I was obliged to confess ignorance as to the cause of death.

Sometime later some of his sheep died, and the owner

became greatly alarmed. I was a good deal worried too at my inability to solve the mystery. In the meantime we had had considerable excitement caused by the death of several children from the effects of being bitten by a dog supposed to have been suffering from Rabies. This, together with the often expressed opinion of Prof. Welch, of the Johns Hopkins University, that Rabies was not so uncommon in America, led me to think that the owner might have been right after all.

Accordingly I requested him to ship to my address in Baltimore, well boxed, a sheep affected with the disease. The animal showed symptoms of nervousness, rage, hyperaesthesia, opisthotonus, inability to eat or drink, and on the following day suffered from convulsions, which were almost continuous. During one of these attacks it fell and was unable afterward to arise. The legs were rigid, the neck drawn back, the eyes glassy. The least irritation to the skin increased the opisthotonus, until the head was so retracted that it lay upon the back of the animal. This sheep died at 6 P. M. and at 8 P. M. a careful autopsy was made. There were no lesions to be found. The medulla was carefully removed and cultures made from the blood and organs. The results of the bacteriological examination were negative. A suspension of the medulla in distilled water was injected into the brain of two rabbits, and both died, one on the eleventh and one on the seventeenth day after the injection. The symptoms displayed by the rabbits were characteristic of Rabies and the result of the bacteriological examination of the blood and organs was negative.

I have observed since then two herds of cattle with a history of Rabies infection, and in each herd have noted the following symptoms. Inoculation experiments were made on rabbits from one of these herds.

CASE 1. Herd of four cows, one had died, two were sick, and one apparently healthy. One of these, an old cow, had been dull for about a week, and had manifested a desire to be left alone. For the past three days she had not been able to eat or drink anything. When attempting to drink she would plunge her head deep into the bucket, holding it there

for a minute, then cease trying. After each attempt she was seized with slight opisthotonus.

"In the other animal, a heifer, the symptoms were much more exaggerated. She seemed very affectionate, would follow closely at one's heels and lick one's hand. When driven away she would go but a few yards, when her back would begin to arch, and her neck draw to one side and slightly upwards. This was followed by loss of control of her legs, (inco-ordination); she would fall and remain in convulsions for a minute or more, then get up and appear as well as before. She could neither eat nor drink and kept up a constant bellowing.

I could not get the owner's consent to destroy the animal, but he promised to inform me by telephone as soon as the animal died. He did not telephone however until more than twelve hours after death, and then in the evening, so that it would have been twelve hours more before I could have reached the place. An autopsy would therefore have been useless. I never heard whether the old cow died or not.

CASE 2. A second infected herd is under observation at present. The history is as follows: Some three months since a strange dog passed this farmer's place. He was said to have acted strangely, carried his head down and his tail between his legs. He bit an old dog, a favorite, belonging on the place. In about a week this dog acted strangely, and bit two other dogs belonging to the same owner, and was seen to bite four head of cattle. The old dog was then destroyed. One of the remaining dogs bitten, sickened and died. The other dog has so far shown no symptoms of Rabies. The owner describes the symptoms of the second dog as dullness, inability to eat or drink, paralysis of the jaws, death. Fifteen head of cattle composed the herd and ten of them have died.\* The symptoms as described by Dr. Smith, of Frederick, Md., were as follows: They at first manifested a desire to be alone, and wandered away from

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\* Another steer died, which has not been mentioned in this article, because inoculation experiments were not completed at the time of writing. We have to-day, however, received a telegram from Dr. Stokes, which says the rabbits inoculated from the brain of this steer died with typical Rabies. Possibly the reason that this dog had not died is on account of his long hair; the one that died having shorter hair.



the rest of the herd; accompanying this was an evidence of dullness and some weakness of the limbs. When startled they would run away and show evidence of fright. When secured in the stable they pawed the ground a good deal, and there was a slight twitching of the muscles. The least irritation would bring on a clonic spasm of the muscles of the back and neck, inco-ordination of the muscles of locomotion, and finally a falling in convulsion. From almost the first appearance of the symptoms, there was complete inability to eat or drink, though the desire to do so remained. Following the conditions above noted was a rapid progression of the disease, until the animals became so furious as to have to be secured. In the bull this stage was particularly exaggerated. He bit his chain savagely, pawed the dirt, and tried to horn everything that he could reach; the saliva dripped from his mouth. I visited this herd several times, but unfortunately at each of my visits the animal affected had died, and only at two visits did I see any of the animals showing symptoms. One of these, a cow, did show certain symptoms, in that she was somewhat excitable and unable to eat or drink. She afterwards died. Another cow showed slight opisthotonus upon irritation, and a partial inability to eat or drink; that is she could drink a little, but was a long time in doing it, and it seemed to cause her a good deal of uneasiness. This cow recovered gradually without showing any more pronounced symptoms. A calf that had been dead about three hours on one of my visits, and had been buried, was disinterred and a portion of the medulla removed and placed in a sterile tube, and kept on ice until our return to Baltimore the following morning. Dr. W. R. Stokes accompanied me on this visit, and to him was entrusted the biological examination. His report is as follows:

"The medulla and cord of the calf were removed under aseptic precautions. Portions of this tissue were rubbed up in bouillon, and about ten drops of this mixture were injected beneath the dura mater of a full grown rabbit, after removal of a button of bone by means of a trephine. Sterile instruments were used, and aseptic precautions were em-

ployed during the operation. A second rabbit was similarly treated. Both animals remained well for eleven days, but on the morning of the twelfth day, one of the animals was found dead. It had previously shown no characteristic symptoms. The second animal showed a paralysis of the hind extremities, and was later seized with convulsions. Typical opisthotonos was also observed, and death followed on the morning of the twelfth day. A careful autopsy was performed upon both animals, but nothing abnormal was observed. The brains of both animals were practically normal. Cultures on glycerine-ager from the brain, liver, and the blood of the heart remained sterile after forty-eight hours at 35° C.

Now, granting that the animals had Rabies, is it probable that all were bitten by this dog and contracted the disease by direct inoculation? I most certainly believe it is most probable. No wounds were discovered on any save the four mentioned, though of course a dog could nip the heels of cattle without any evidence of a wound, but sufficient to cause inoculation. With our ideas of the instability of the poison, it does not seem possible for it to affect the grass or feed. One observation, however; these cattle all drank out of the same trough and running water did not pass through it.

These observations, though few in number, have convinced me that Rabies is quite prevalent. That it is a specific disease communicable by inoculation is now admitted by practically the whole medical profession. It has been demonstrated, moreover, that the poison is very easily destroyed and that it requires but little interference to render it harmless.

Most of the bites from which people suffer are inflicted upon some bare place, such as the face or hands. Where the virus has to pass through clothing it seldom does any harm. The fact of the poison being so unstable makes it almost beyond all doubt that the only way of conveying the disease is by inoculation.

No dog ever has Rabies unless he has been bitten by some animal affected with the disease. Here then lays the keynote to protection. Dogs probably are the most susceptible

of our domestic animals to the disease, hence control these animals. Tax them heavily enough so that only those to whom they are useful, or who can afford them as a luxury, will keep them. Kill indiscriminately all those dogs not protected by license, and I venture the prediction that Rabies will soon be almost a matter of ancient history, and our faithful, well-bred friend and companion, when he happens to have a fit from over-indulgence of food and lack of exercise, will not have a policeman for his medical attendant and a bullet for his medicine.

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#### DISCUSSION.

Dr. Salmon: I am very glad indeed to hear the paper that Dr. Clement has just read. It seems to me the subject of Rabies is one of the most important, for the reason there are a considerable number of persons in the country who are very active in disseminating the doctrine that there is no such disease in existence; that all the accumulated evidence in its favor of the past two thousand years is in error, and should be discarded, and that we should adopt the views of the few gentlemen that have started out with this new idea, and inform people that there is no danger to be apprehended from this disease. I am opposed to taking any hasty or radical action in a matter of this kind, because I do not want this Association to put itself in a position where it can be accused of hasty action. I believe the time has come when we must meet discussion along this line, and, if we are not prepared to do so now, let us make investigations and submit our views at future meetings. Let us appoint a committee and make investigation and allow every member an opportunity to express his views. If we find the gentlemen are correct in teaching that this is a very rare disease, let this Association place itself on record and admit the truth in regard to this question.

I know it is said that it is very unwise to cause apprehension of danger from this disease; that there are some people whose nerves are so weak that they become affected

with false Rabies if they have even been bitten by a dog that had not this disease at all, and there are many deaths caused in this way. That is the question—to draw a line of distinction between true Rabies and false Rabies. Our business is to determine the presence of true Rabies, and to give the people of the country the facts in regard to that disease and also to indicate to them the measures by which the disease may be controlled and eradicated. If physicians are unable to discriminate in their practice between true and false Rabies, that is their affair and we are not responsible for their errors of diagnosis. I have seen in one of our veterinary journals an editorial which seemed to convey the impression that the danger from Rabies was very much exaggerated, and that probably there was no such disease, and if there was such a disease, it was very rare. I have also seen within a short time an editorial in one of our leading medical journals—the Medical News, which is based on a similar article sent out by one of the humane societies, which would give the impression, first, that there was no such disease as Rabies; secondly, if the disease exists it is very rare; and thirdly, that a great number of cases of Rabies have been cured with vapor baths. Now, the Medical News, in commenting upon this paper, took the position that the conclusions were about correct, and it particularly confirmed the statement of Mr. Haynes, that not one case in a million of those alleged to be Rabies, were real Rabies. Now think of that, gentlemen. You might consider that an exaggeration from a popular writer, but when it comes from a leading medical journal under the authority of one of the leading physicians in one of the greatest cities of the country, that not one case in a million of those alleged to be Rabies was really that disease, it seems to me that the exaggeration is simply amazing. It is also a fact, as you know, that one of the physicians of Philadelphia, advocates the same view, that a physician of New York holds to it, and teaches it, and that a reputable physician in Washington has inserted an advertisement in the newspapers offering one hundred dollars reward to anyone who would bring to his attention a true case of Rabies. This makes it all the

more important that we should have reliable evidence and further information along this line.

Since I have been in Washington, we have spasmodically paid some attention to Rabies. Some years ago, when we were making a little investigation of mysterious cattle diseases we made inoculation tests of the brains of ten dogs that were reported to have died from Rabies. Out of those tests the rabbits inoculated from eight cases died of Rabies—eight cases out of ten, or at the rate of eighty cases out of one hundred. We have made a number of other tests during the last few years, and have found not quite as large a proportion, but still we are frequently finding animals that are affected with Rabies. During the time since we commenced investigating this matter, I think in 1893, there has been brought to our attention twenty-one cases of Rabies in dogs, one in a horse, two in foxes and three human cases. All of these cases were discovered notwithstanding we were making no systematic effort to find the disease. Now it seems to me that this is sufficient to show there is a great deal of Rabies in the country. I believe from my observation there are a great many more cases than are reported. Of course there are a great many cases which are not reported; and many reported as Rabies are not that disease. When you come to average it up, I believe there are more cases of genuine Rabies in the country than reported. You will remember when Dr. Moore was investigating in the West he found by inoculating rabbits with the brains of cattle that died from a mysterious disease, that he produced Rabies. Just awhile before I left Washington there was a mysterious disease among cattle in Virginia. I sent a man out to investigate it. They died in the course of a few days after contracting the disease. Inoculations were made from the brains of one of these animals on some rabbits, and the last day I was at the department—last Saturday—both rabbits were very much excited. So far as could be told, they were coming down with Rabies.

I believe that it is important that this body should make an investigation and request our different members to bring in their evidence before this Association at future meetings,

that we should be prepared in the course of a few years to give an opinion that would carry weight in settling this matter.

Dr. Cotton: We had two outbreaks of Rabies. In the month of August, 1894, a farmer living near where I was had a shepherd dog that he sent to the pasture fields after the cows. He noticed for two or three days that the dog had acted strangely; he was very gentle usually. On a certain day he ordered the dog with a good deal of vehemence to bring the cattle up, and he went and severely bit four of them. The owner whipped him after he came from the pasture field, and the dog immediately left, and that was the last time the owner ever saw him. He came into Mt. Vernon where I lived. His place of loafing was about two squares from my house. He would go up and down that street repeatedly, and pay no attention to anybody at all. He was a beautiful animal. He had a peculiar habit of grasping the spokes of wagons that went by, and really performed feats that would under ordinary circumstances break his neck. He would turn clean over with the wheel sometimes. One day I noticed there was a commotion in the viaduct, and I looked and saw he was engaged in a fight with a bull dog. That was in August. The dog bit three or four other dogs, but he still kept up his practice of walking up and down Main street until on a certain Saturday, when my daughter and I happened to be out riding, he rushed at my horse and I struck at him. He then undertook to catch the buggy wheel. The neighbors killed him. There was nothing known by the owner of the cattle about the dog acting this way. He noticed in a few days that one of his cows acted strangely and later on that she again acted strange. She was at last killed. Before she was killed she would run about the field with the other cattle and often run after people and gnash her teeth as if to bite them—something unusual for a cow to do. That animal was killed because of the dangerous condition she was in. Another of his cows was killed, and the only thing he noticed in the other animal was that it was hooked by the rabid cow.

He killed her. One of the animals got so bad that she died from the disease.

In the month of December a bull dog ran up in the city one night when Main street was crowded and bit eleven people. It scared the people very much—they were poor—and we sent them to the Pasteur Institute in Chicago, and they were treated, so we don't know what might have happened them.

A few years before that there was a dog went through the western part of the county and I was called out to see the animals that were supposed to have Rabies. When I got there I found cattle, horses, sheep and dogs all rabid, I am satisfied, and we destroyed every single animal. I think altogether there were twenty-three of the different animals affected with Rabies.

Dr. Ellis: We had a case in St. Louis about a year ago last month. Dr. Crowley was called in to diagnose this dog, and called it Rabies. This dog bit the coachman and about ten dogs in the neighborhood. It became so violent that Dr. Crowley killed it before I saw him, to protect himself. We did not hold any post mortem on the case. That has been a year ago last month. Those dogs are all living.

Dr. Parker: Sometime ago I had occasion to see a dog that was showing all the symptoms of dumb Rabies. The history of the case was, that the dog belonged to the engineer at the water works and it was taken down there every morning for exercise. One of the engineers at work there, also had a dog, and it was brought there for the same purpose. The first dog was taken into the laboratory and inoculations made, and Rabies demonstrated. Some two months afterwards, I was called to see the other dog. I didn't know there was any connection between the two, but this second dog showed all the characteristic symptoms of dumb Rabies the same as the first one.

Dr. Meyers: I was called to see a horse that was restless. I found that he had been at work that morning and had been rubbing the side of his face on the pole and he had a red surface on the side of his nostrils, which seemed to be irritated very much. I didn't know exactly what it might be.

I wanted to give him a hypodermic injection. When attempting to do so he struck forward with his forefoot, but did not hurt me much. I sent him over into another department into a box. That horse threw himself—if once, he threw himself a hundred times within two hours, and what was another very peculiar symptom, he would urinate about every fifteen minutes. A person could hardly imagine a horse could pass that much. In falling, he would allow himself to fall over, without attempting to use his feet. We had him in a box-stall that night. We could not get near him—the owner wanted to have him destroyed. We had no other means of killing him than an ax, and nobody would go close enough to him. Finally he put his head close to the door and we struck and killed him.

Two days afterwards another horse manifested similar symptoms and got violent. Nobody could get near him, so we tied him to a beam that was in the middle of the floor, and he displayed the same symptoms by urinating and by throwing himself. Both horses had a disposition to bite, in fact were dangerous. You could not attempt to go near them—they would bite. He lived less than twelve hours after taking the disease. I made a post mortem examination of the first horse, and everything was natural. The second horse that died I removed the brain. Even there I could not discern anything wrong, except it looked considerably congested. We let the head lay around the stable until the next day. I had a mastiff bitch that had a litter of pups. She was in a hay loft. She got down during the night and ate all that meat, and it was not more than a week until she developed symptoms of Rabies and got violent. What I observed at first—I had another bitch, a French poodle bitch, that had pups also. The mastiff used to carry these pups and put them beside her own. The bitches would fight, and as soon as I found that out, I separated them. I put the mastiff in a safe place, and put her pups with her. She did not bite them but would separate them and bring them together again. She was howling a great deal and excited, and she had partial paralysis of the lower jaw; the mouth was opened about half, may be three-



fourths, of an inch. I think on the second day I killed her, and the pups I took to the country that I could see what would become of them. They developed Rabies; they got restless and crying and one died after the other; and the other bitch, the French poodle, also got Rabies.

I learned since that this brewing company had a dog that died, and on inquiry I learned that that dog had Rabies. It was a Newfoundland. I have seen several other cases of Rabies in horses and they developed almost the same symptoms in reference to throwing themselves, flopping over, and excessive urination.

I am a firm believer in Rabies, and I think we should consider it more, and come to a means of preventing this disease.

Dr. Dalrymple: I have had a couple of cases in the last month. An owner stated that the previous day a yearling had died with symptoms of excessive diabetes. He only thought it was a matter of sickness and did not trouble about it, but found next day that there was a cow similarly affected. The animal was in a field. The skin about the face was bleeding and torn from scratching with the hind feet, and the animal was very much excited, foaming at the mouth, and very active on her feet, though very feeble. The next morning she was found partially paralyzed, with mucous discharge foaming at the mouth. She died of paralysis. Just previous five animals, which I heard of, presented similar symptoms. I suppose I have had six or seven outbreaks of Rabies within the last few weeks. I think there is no doubt about the existence of Rabies.

Dr. Hoskins: I wish to refer to the statement made upon the floor, as well as to give my experience in the matter, on which largely the editorial referred to was based. For about six years I have had a district in the city of Philadelphia in which so-called Rabies, with all the symptoms generally outlined by several gentlemen who occupied the floor before me, has existed. Since January 1st, 1896, I have personally treated sixteen dogs in this one district, and I have personally adopted the plan of advising all my clientele that there is little to fear in the city of Philadelphia.

We have not had a case of the so-called Hydrophobia or Rabies in the human family for five or six years, even from those who take the position that the disease does exist. It was upon this experience of mine, with that of many other like reports of our experience in Philadelphia, where we had been dealing with diseases in serious form for a period of six years, that the editorial in the Journal was published.

Dr. Jameson: After hearing Dr. Clement's paper it came to my mind that in July, 1896, a gentleman came in and said he had lost one animal and had two others sick. The first symptoms I noticed were trembling and foaming at the mouth. The next morning the cow was down, and during the day it died. At certain times it had a wild and glaring look, and would fall in collapse, and lie prostrate for possibly ten or fifteen minutes, then rise to its feet. I advised the killing of the cows, but he left them alone, and one lived twenty-four hours afterwards, when it was destroyed. I would like to hear from some gentlemen who have had more experience or more knowledge, whether there is any liability of communicating the disease by drinking the milk from a diseased animal. In this case milk was used for two days after the animal was first affected. Up to this time there has been no bad results.

Dr. Plunkett: In this city within one month two human beings were reported as dying from Rabies. There are no special regulations in the courts here, or ordinances, requiring muzzling at certain seasons of the year. I think this is a matter that ought to be reported upon, and I am glad to have you gentlemen bring it up in all its points as far as possible.

Dr. Meyers: This horse which I referred to when speaking before bit his partner down the neck in six or eight different places, some bites produced only abrasions, but others of them were deep. The horse is still in the brewery and has never developed any symptoms of Rabies, and I infer from that that the horse can not communicate it.

Dr. Pearson: This matter of Rabies is one we have had a great deal of experience with in Pennsylvania and has been the subject of a great deal of study, especially during the

last few years. There is a vicinity close to Philadelphia where Rabies is exceedingly common, and where cases are reported in dogs—I was going to say every few days—certainly every few weeks. The cases run up into the hundreds each year, but so long as I have lived in Philadelphia I have heard of no case of Rabies among people in this vicinity. Notwithstanding that fact I have known a few instances where people were bitten by these dogs that were supposed to have Rabies. Now there are two questions that are important—have the dogs Rabies? and if so, why is it that people when bitten by these dogs do not contract Rabies? In the first place as to the nature of the disease. We have inoculated rabbits. They have died after presenting the characteristic symptoms of Rabies. We have not been content with inoculating single rabbits, or carrying the disease through one generation, but have inoculated others, until we have reached the maximum virulence of about seven days, and I think that is conclusive evidence that the disease is Rabies, because the symptoms are characteristic in all cases. The first rabbit inoculated always presents a very long period of incubation. When dogs are bitten by these rabid animals they always go a long time before they develop Rabies. There was a watchman in Philadelphia who had a very large dog bitten by a dog supposed to have been mad, although it is not known positively that he was, because he was shot. This St. Bernard developed Rabies and was brought to the veterinary hospital of the University and was kept there about two days, and the disease became very violent.

A man was bitten by this dog on the day before the dog presented the very marked symptoms of the disease. The man is still alive and going on with his regular work, and the case occurred about four or five months ago.

Now, I don't think that that proves that people can not become inoculated with Rabies. I think it proves that Rabies may assume rather a mild character. I believe that that is the case in certain districts. It has been observed, I believe, that when a rabid dog bites a cat the cat will develop Rabies in a more intense form. That is, the germ of the

disease becomes more virulent after passing through the dog into the cat, and if that cat bites another dog, that dog dies in a shorter period, proving that that is the case; and it may be that in the more violent outbreaks of Rabies that we have occasionally, that the fox, skunk, or some wild animal, is bitten by the rabid dog and the disease in in that way intensified.

There was, last summer, an extensive outbreak of virulent Rabies and five men died. One of the men bitten was a veterinary surgeon, who did not believe in Rabies. After being bitten by this suspicious animal he treated the matter lightly, and it happened that he was treated by a physician who did not believe in Rabies, and when three weeks afterwards he complained of constriction of the throat, dizziness and general nervousness, and pain in the hand and in his arm, the physician who treated him thought it was some nervous affection, and as it became more intense he sent to Philadelphia for a prominent physician. Now it happened that this doctor was on record as not believing in Rabies, but after seeing the patient, who died a few hours after the consultation, he said that he had no doubt the death was due to Rabies, and he believes in the disease at this time. Dr. Rechtenwald, of Pittsburg, who is here, has just told me of an outbreak of Rabies that has occurred in Allegheny county, Pennsylvania, during the past year. He has seen nine cows, ten dogs, two mules and one horse—twenty-two animals, that have presented well-marked symptoms of Rabies; some of them in a most violent form. He tells me of one cow that broke a rope an inch thick and attempted to attack persons who came near. He told me of another cow that was exceedingly violent and attempted to attack people and would have done so, but was confined by a strong chain, and, as answering Dr. Jameson's question, he spoke of one case where the milk of two cows suffering with Rabies was used until the day before the cows died, and no harm resulted from it.

As peculiar symptoms developed by Rabies, I might refer to an outbreak that occurred during the present summer in Pennsylvania, where a dog that was evidently mad, bit a

number of sheep in a flock, and in about three weeks one of the sheep became violent and died, and the others developed the same symptoms in turn until all but one died. These sheep were exceedingly violent; their general demeanor was changed entirely, and, strange as it may seem, they made attempts to bite people. They were in a close pen and when a stick was poked in through the fence would bite the stick, would rush at it with their mouths open.

Dr. Stewart: If I remember rightly, I saw a little article in the *Journal of Comparative Medicine* not long ago relating to this subject, in which it was held that there is no such disease as Rabies; that it is a variety of septicaemia. Like others, I have seen numerous cases in the various animals, and, as I understand this disease we call Rabies, it has no symptoms in common with what we know as septicaemia. Those who hold there is no distinct disease which may be called Rabies have failed to show that the morbid phenomena which are quite constant features of this condition, which is so universally recognized under the name Rabies, are really part or phase of some other disease.

Prof. Law: I have been amongst those who deny the existence of Rabies from my studentship up. I have seen so much of the inoculation and experimental inoculation from man and beast, with successful results, that I must state in a most positive manner that there is such a disease as Rabies; that it has classic features, as described, varying, of course, in different cases. At the same time, as the gentleman said some time ago, we are having a rather one-sided talk on this subject. There are cases, as Dr. Salmon said, of Pseudo-Rabies. One such came under my notice. It was condemned as a case of Rabies by every physician in Ithica, and with the administration of a dose of castor oil and some tonic, followed with a little mental confirmation to combat the boy's fears, he recovered and went to school and in a week or two got well. The disease is common enough, no doubt of it, and to say that there are no Rabies on the basis of such a case is absurd.

With regard to the records that have been made in Philadelphia and elsewhere, there is one physician in Philadelphia

who claims that he has hunted, and is satisfied there is no such thing. He had not taken even the standard American works, had not referred to the American System of Medicine by Pepper. There were cases reported that were tested by inoculation just such as have been mentioned here. If a man has been bitten by a dog, in any case where there is the slightest doubt, it is very important that the animal should be inoculated. It is easy to say we recognize it as occurring in men. There are no doubt a certain number of cases, but if we inoculate a dog from that man, then we have developed something different from hysteria; we have Rabies.

Dr. Clement: I would say, in substantiation of the remarks made by Dr. Pearson, that we may have very mild cases of Rabies. In my paper I stated the case of two cows, and that they evidently had Rabies in a very mild form, and recovered. That is to say, they presented the symptoms of the other cows, and then recovered; that of course must have been a very mild form of Rabies, unless the diagnoses were wrong. It shows that there may be a recovery when they actually have Rabies.

Prof. Law: A number of years ago I got from Dr. Herman Biggs a portion of the medulla of the keeper of the dog pound at Newark, N. J. I carried this infecting material to Ithaca and inoculated three rabbits—one on the brain, which died in sixteen days of paralytic Rabies, and two hypodermically, which died on the seventy-second and the one hundred and eightieth days, respectively, of the same disease. Two rabbits had each three hypodermic injections of one drachm of a sterilized solution of the medulla on as many successive days, and a third rabbit had four such injections on four consecutive days; then all three were inoculated with the virulent brain matter, but although all were kept for nine months no sign of Rabies was developed. A dog had three injections of twenty drops each of the sterilized medullary matter on three successive days, and was then inoculated with virulent matter on the brain. This dog died of furious Rabies on the twenty-fifth day after the last injection. That death was delayed for nine days after the regular period, (sixteen days) in cases of inoculation on

the brain, argues that the previous inoculation with the sterilized toxins had reduced the susceptibility, though not to the extent of entirely preventing the disease. The failure to prevent the disease in this case might be attributed in part, perhaps, to the smaller dose of the toxins relatively to the live weight of the dog, and in part to the greater susceptibility of the canine constitution, over that of the rabbit. The entire immunity of the rabbits treated with the sterilized toxins, speaks unequivocally for the protective action of the sterilized toxins, in the absence of any live germ, and offers a method of immunizing, which is infinitely safer than that furnished to us by Pasteur.

## DISCUSSION ON MILLET FEEDING.

[See report 1873, p. 103, and report 1896, p. 207.]

Dr. T. D. Hinebauch made the following remarks on Millet Feeding:

I desire to bring up this question again this year from the fact that I was not present last year and had no chance to discuss it, and there seems to be some veterinarians who think that what I term millet disease is osteoporosis. I have seen osteoporosis and this disease I term millet disease, and although they have some symptoms and post mortem appearances in common, yet the diseases are entirely different, and it is with the hope of having a discussion on this subject that I have brought it up. Since I presented the last paper I have had correspondence from the states of Nebraska, Kansas, South Dakota, Illinois, Pennsylvania, Wisconsin and Minnesota, showing that the disease as I first described it in 1893 exists in all of those states, to a greater or less extent. Why it has never been brought before the profession before I do not know. When it was first called to my attention in 1891 there were any number of cases in the state of South Dakota, and also in the western part of Minnesota, where I came in contact with breeders and stock raisers. I will read but a single letter out of the many which I have received, as this shows as well as any I have the condition of things as they exist in the different states.

I have a letter from Dr. Dickson, of Williamstown, Delaware, that was written last year, giving the details of three cases which he considers were identical with those I described as millet disease. About the only symptom that is common to both diseases is that when the animal breaks down and the tendons give way, they sometimes carry spicula of bone



with them taking the periostium as well. We have gone into quite an extensive examination of millet, and it is believed to give out an albuminoid which produces the identical results experimentally. We have not used the material on horses, but have used it on smaller animals and can produce very profuse urination by injections hypodermically of this albumenoid. In about two or three hours, rarely two hours but always before three hours, the animal has unurinated very profusely, making attempts to urinate every ten or fifteen minutes where large doses have been given, showing that we have at least one of the products which produces this disease. Our experiments are still being conducted along that line, both in the laboratory and in practice.

Dr. Cary: I would like to ask Dr. Hinebauch if he ever noticed any facial enlargement in this millet disease?

Dr. Hinebauch: No, sir. Osteoporosis comes on slow and this always comes on in acute form. If the feed is immediately discontinued at least ninety per cent. of the cases will recover without treatment. That is pretty good evidence to me that it is not osteoporosis.

Dr. E. P. Niles: This seems to be quite an interesting subject, and one I judge many of us have had very little experience with. In my section of the country very little millet is raised. I have in mind one case, however. When I diagnosed the disease Dr. Hinebauch has just been discussing, this being my first case, I was not quite positive of my diagnosis. The case was that of a colt about a year old. He had been fed on millet for some time; this was the exclusive diet. The colt was stiff in the loins, as the owner expressed it, and there was also a circumscribed swelling of the gluteal muscle. As he had been eating millet exclusively, I told the owner I thought he had better discontinue the feeding of the millet, which brought about a permanent recovery.

It seems to me that there are several points to be brought out. Dr. Hinebauch says that osteoporosis is chronic. I understood him to say the millet disease is acute. That is, one runs its course slowly and the other quickly.

Dr. Hinebauch: I did not make that statement. I said

one developed rapidly while the other developed more slowly. The osteoporosis develops more slowly.

Dr. Williams: From my observation osteoporosis may be either very acute or very chronic in its course. It may kill in the course of a few weeks, or it may scarcely show any symptoms at all and the animal recover. There is so much difference in the constitutional diseases of the bone in animals in various districts that we are in a rather bad plight as to the nomenclature.

## BACTERIOLOGY,

BY DR. GEORGE W. KINNELL.

MR. PRESIDENT: In compiling the history and the outstanding features of the science of bacteriology, I have availed myself of the most recent and authoritative literature on the subject. It is an ever-changing and widening field. Probably along this more than any other line of medical research, are opportunities for discovery, and victories to be won, while its study and conquest are freighted with the brightest promise for the happiness and well-being of man, and for the health and well-being of the various races of animals that man has rendered friendly to him.

Wherever organic matter is found under suitable conditions of warmth and moisture, there bacteria exist; consequently it is hard to find a place where they are not and it has well been said that the bacterium is all but ubiquitous.

Thus the earth, wherever there is vegetation, teems with them. They are being constantly wafted and carried by the currents of air in the lower strata of the atmosphere. They are present in the water of the ocean. The beautiful phenomenon of phosphorescence as seen in the wake of a ship is due to bacteria. To a greater extent still they are found in the water of lakes, ponds and streams. It is only in the water from springs and deep wells, penetrating the lower strata of the earth, that they are absent.

They are found in the rain drops washed from the atmosphere in their fall. In the same way they are found embedded in hail stones and in flakes of snow.

We find them swarming on the various free surfaces of men and animals. In the mouth and throat of a perfectly healthy person no fewer than six different varieties of bac-

teria are to be found. They are present in the stomach and intestines and throughout the respiratory tract.

At the present time there have been isolated and described no fewer than five hundred different kinds of bacteria and the number is constantly being added to. It is fortunate for us that, as compared with the great mass of these organisms, but few of them are our foes. The great majority are perfectly harmless to us, while a few of them are actually helpful. As examples of helpful bacteria need we mention the yeast plant, by which we raise our bread; the *micoderma aceti*, or mother of vinegar; or the *saccharomyces cerevisiae*, of vinous fermentation, by which alcohol is produced. The most recent variety of bacteria to become an article of commerce are the nitrifying bacteria which, when mixed with manure and earth, greatly conserve and hasten the process of the conversion of ammoniacal compounds into nitrites, thus supplying a most important element of plant food. These bacteria, in the form of a spawn known by the name of nitragen, are an article of commerce in Europe to-day. And further, as our knowledge of the bacterial family increases, we are becoming able to turn to account those very bacteria which have been most harmful to us, and are making them subservient in preventing and curing those injuries and affections which hitherto they have caused.

The science of bacteriology as we know it to-day is of comparatively recent origin, and yet, many, many years ago there were faint glimmerings of the sunrise on this hitherto undiscovered world. Thus Athanasius Kirchetz, who lived towards the end of the sixteenth century, affirmed his belief that many diseases were due to a living contagium. The promulgation of this view was coincident with the invention of the microscope, and by it he had demonstrated the fact that all decomposing substances swarmed with myriad little creatures invisible to the naked eye.

About one hundred years later, in 1675, Anthony Van Leeuwenhoek, who has been called the father of microscopy, had so far improved the construction of the lenses of the microscope that he was able to demonstrate the size, form

and movements of minute organisms in rain water, well water, in infusions of animal and vegetable substances, in saliva and scrapings from the teeth; and his discoveries were in that year published in a series of letters to the Royal Society.

During the eighteenth century no very considerable progress was made in the investigation of bacteria in their relation to disease, yet the belief in them extended throughout the medical profession, and there were not wanting those who claimed for them the causation of all diseases, but as such claims were entirely unsupported by demonstrated facts, the theory became a subject of ridicule and was lost sight of until about the middle of this present nineteenth century.

While the question of animalcules as related to disease had been abandoned, yet the study of bacteria went on at a lively rate along another line. The question which now engrossed the attention of scientists was not as to whether bacteria existed, no one now questioned that; it was not as to whether they were the cause of disease, this feature the savants had for the time lost sight of. The supreme and vital question now being agitated was as to how bacteria originated, or, in other words, the theory of spontaneous generation, a question which was felt to involve the stability of the whole ethical and theological framework of society.

There are many bright names among those investigators of this theory of spontaneous generation, notably Pasteur and more notably still, Professor Tyndall. The latter proved to a scientific certainty that the idea of spontaneous generation was a fallacy; that no such thing was possible, and enunciated his famous biological law that all living cells are derived from pre-existing living cells and that, under no circumstances do they arise *de novo*. I think I am safe in saying that the discovery and appreciation of this law ranks equal in glory and usefulness with Newton's discovery of the law of gravitation. Tyndall's work was complete in itself and a final settlement of the question, but after all it was but the stepping stone to a discovery more palpably brilliant and of scarcely less importance. Tyndall's researches set

the intensely practical mind of Joseph Lister in motion, who, engaged in surgical practice in the Edinburgh hospitals, was constantly confronted and thwarted in his work, by those bugbears of the surgeons of that time, hospital fever, erysipelas, suppuration, septic poisoning, septicæmia and gangrene. Associated with these conditions, which were considered inseparable from surgical work, he noticed, as others had done before him, the constant presence of myriads of different germs. Believing that these germs were the primary cause of complications, and seeing how Tyndall had succeeded in sterilizing organic compounds, and how that such compounds remained free from putrefaction and change so long as germs were kept from them, he asked himself the question, was it not possible for him to keep his operating room and the wounds he made, sterile? Or failing that, could he not by certain agents, harmless to his patients, either kill the germs or so modify them that they would be incapable of producing the changes and harm of which he believed them to be the cause? Consequently he entered into a study of antiseptics and disinfectants and the method of applying them, and the result was the elucidation of his wonderful system of antiseptic surgery, thus creating a new epoch in both medicine and surgery, elevating the latter from a disappointing and often unsuccessful art, and placing it on the plane of almost an exact science.

But the success of his methods demonstrated in the most irrefragable way the active relationship of bacteria and disease, and opened up the whole question anew. Coincident with his discoveries were the investigations of Pasteur of the causes of fermentation, and these together form the basis and tangible starting point of the bacteriology of the present day.

Bacteria are the very simplest, lowest ultimate forms of living things. Each one consists of but a single cell, is a complete entity in itself, and each cell possesses in itself all the essential properties of its class. They belong to the vegetable kingdom, and all the pathogenic bacteria at least are parasites.

By qualitative analysis they are found to consist of about

eighty-four per cent. of nitrogenous substance, with lesser quantities of fat and ash. The ultimate analysis of the nitrogenous part shows it to consist of carbon, hydrogen and nitrogen, but curiously enough neither sulphur or phosphorous.

Botanists have for a long time been trying to devise some adequate system of classification of these entities, but so far no really scientific system has been discovered, and like every other question not settled on a scientific basis, no end of systems have been suggested and are in vogue.

In dealing with pathogenic bacteria, a fairly workable system is found in classifying them according to their shape; the bacteria coming under the pathologists notice being fairly regular and stable in this respect.

Thus we have the micrococcus, the round or oval bacterium.

The bacillus, or straight rod-shaped bacterium.

These vary greatly in length. Sometimes they are quite long. At other times they may be so short that their length is not more than one-half or one-quarter of their thickness, but whether long or short, bacilli have throughout one essential feature, viz: that two of their sides must be parallel.

Modifications of the bacillus or rod-form are the vibrio or bent rod; the spirillum or cork screw form; the leptothrix or straight filament; the spirochaeta or wavy filament; and where this is looped and twisted on itself, the spirulina.

Many bacteria, especially the elongated forms, have the power of motion and locomotion, while others are inert and non-motile. A few at certain stages of their existence and under certain conditions, are non-motile, while at another stage and under different circumstances, are freely motile and active. Locomotion may be accomplished by a serpentine movement, or again by the agency of little whip-like flagellae or tails. In some of the latter species it has been demonstrated that the flagellae are prolongations of the protoplasm through the cell wall.

Bacteria vary greatly in size, but all of them are very minute. Taking the red blood corpuscle, with its average

diameter of 1-3500 of an inch, as a standard of comparison, we find that the length of the bacilli of glanders and tetanus is from one-third to one-half the diameter of the red blood cell; the bacilli of leprosy, tuberculosis and diphtheria, from one-third to two-thirds; while the length of the bacillus of anthrax is from two ten times the diameter of a red corpuscle.

Viewed in this way we can readily understand how easily they can be wafted through the air either free or adherent to particles of dust; how readily they may gain entrance to the system through the alimentary or respiratory tracts, or from the surface of wounds and sores, and once having gained entrance to the system, how thoroughly and completely they may penetrate to every part of the body in which the blood circulates.

The activities and life of bacteria are affected by extremes of heat and cold and by a great variety of chemical substances, classified under the heads of antiseptics and disinfectants.

It has been customary to make a distinction between these two terms; an antiseptic being an agent which will not kill the bacteria, but will so affect them as to render them innocuous and incapable of producing disease. A genuine disinfectant, on the other hand, not only renders them innocuous but kills them. Thus most of the dressings applied to wounds and used in surgical operations are antiseptics merely. Agents strong enough to act as disinfectants would be hurtful to the animal economy, and might give rise to results not less serious than effects they were used to combat.

And yet while the distinction is a necessary one, it is after all a distinction only of degree and not of kind. Thus typical antiseptics, if used strong enough and long enough, become disinfectants, and on the other hand agents looked upon as typical disinfectants, when diluted sufficiently, act merely as antiseptics.

An interesting feature of this subject is the marked variation that exists between different bacteria in the way they are affected by different antiseptic agencies. Take the



influence of the atmosphere or, in other words, oxygen. Some bacteria cannot live without it, while many are effectually killed by its presence. Others again, when exposed to the atmosphere, are only modified and weakened. This weakening property was utilized by Pasteur in the preparation of his material for protective inoculation against hydrophobia.

Then again take the influence of temperature and we find a considerable variety exists. Most bacteria thrive best at about the heat of the human body. When the temperature falls below  $40^{\circ}$  all of them become dormant and incapable of multiplication, but in order to kill them exceedingly low temperatures are required. Thus it is stated that the bacillus of anthrax, after exposure to a temperature of  $110^{\circ}$  cent. still retained its vitality. Their power of resistance to heat, and especially heat associated with moisture, is much more limited. The great majority of them are killed at a temperature of  $150^{\circ}$ , but there are a number that will withstand heat up to the boiling point of water. In the case of spores, even that is not sufficient to kill them, unless kept up for a considerable time or frequently repeated.

When we come to examine them in relation to chemical agents, we find that here also variety exists, and the more we study the subject the more we become convinced that the whole subject of antiseptics and disinfectants requires the most careful revision. It would be claiming too much to say that each bacterium should have its own special antiseptic, and yet there would be a grain of truth in the claim. Take, for instance, the much vaunted bi-chloride of mercury solution. This agent as a disinfectant was first brought into public notice about twelve years ago, as the result of a long series of experiments by Koch. The results which he seemed to have gained by dilute solutions were nothing short of marvelous. Later, however, Geppert and Behring pointed out that the system adopted by Koch in carrying out his experiments was altogether unreliable and misleading, and this criticism has since been freely acquiesced in by Koch himself.

Crookshank, of London, in 1892, instituted a series of

experiments to test the relative efficacy of mercuric bi-chloride and carbolic acid in antiseptic surgery, with results which were entirely in favor of carbolic acid. The following quotation is from the fourth edition of Crookshank's Bacteriology, published September, 1896:

"*Staphylococcus pyogenes aureus* and *streptococcus pyogenes* were not destroyed, even when corrosive sublimate solution of 1 in 1000 was allowed to act for an hour. In the case of the cultures of *streptococcus* of *erysipelas* the results were different. A solution of 1 in 10,000 had no effect, but 1 in 4,000, acting for one minute, destroyed the culture. With carbolic acid the results were very striking. Cultures were exposed to solutions of 1 in 20, 1 in 30, 1 in 40, 1 in 50, for one minute, five minutes, fifteen minutes. The attempts to make subcultures in every case failed. Carbolic acid, 1 in 40, acting for only one minute, was sufficient to destroy *streptococcus pyogenes*, *streptococcus erysipelas*, *staphylococcus pyogenes aureus*. Further experiments were made with tubercular sputum, the test being subsequent inoculation of guinea-pigs. Corrosive sublimate solution as strong as 1 in 500 had no effect, but 1 in 20 carbolic acid, shaken up with the sputum for one minute, completely neutralized it.

"Koch's statements with reference to the germicidal power of corrosive sublimate in extremely weak solutions had led Lister to substitute it for carbolic acid as a detergent in surgery. The author's experiments, which were undertaken in 1892, encouraged Lister to revert to the use of carbolic acid, which, indeed, had always proved efficacious in surgical practice. Lister pointed out that carbolic acid has also the great advantage of combining eagerly with fats and epidermis, so that the seat of operation can be effectually cleansed.

"These experiments also point to the conclusion that carbolic acid should be used in hospital wards for the disinfection of tubercular sputum instead of mercuric chloride and other less efficacious disinfectants commonly in use."

We know that many successful surgeons have been employing bi-chloride of mercury in their operations, apparently with the best results. On the other hand, Lawson

Tait, of Manchester, a pioneer in abdominal surgery, and a highly successful operator, entirely dispenses with the use of antiseptics during operations and relies on simple cleanliness in doing his work.

Matters of this kind are always of great importance to every one, and especially are they important to the veterinary profession just now, when so much money is being expended and so much being done for the eradication by slaughter, of contagious diseases among the domesticated animals. The ultimate success of our work is going to largely depend on the manner in which the infected stables and buildings are subsequently managed. Take for instance the disease tuberculosis. I believe I am strictly within the limits of truth when I say that in carrying out disinfection bi-chloride of mercury is practically the only remedy used, and yet we have seen that for this particular disease, it is as a disinfectant practically worthless. For my own part, I would far rather rely on soap and water with scrubbing and scraping than on disinfectants. They are important enough in their way but we entirely miss the mark if we do not give scrupulous cleanliness the first and foremost place.

In order to demonstrate to a scientific certainty that any given contagious disease is caused by an individual organism four requirements must be fully met and satisfied. These four requirements, which have been called the postulates of Koch, are as follows:

First. The micro-organism must be found in the blood, lymph or diseased tissues of a man or animal suffering from or dead of the disease.

Second. The micro-organisms must be isolated from the blood, lymph or tissues and cultivated in suitable media outside of the animal's body, through successive generations.

Third. A pure cultivation thus obtained must, when introduced into the body of a healthy animal, produce the disease in question.

Fourth. In the inoculated animal the same organism must again be found.

When brought to this crucial test we find that the diseases which have been proved due to an individual micro-organ-

ism are comparatively few. Of these may be mentioned anthrax, glanders, tetanus, tuberculosis, hog cholera, diphtheria, Asiatic cholera and, perhaps also, rinderpest. On the other hand, of such contagious diseases as hydrophobia, pleuro-pneumonia, foot and mouth disease, influenza, strangles and many others, we can only say that as yet the specific cause is undetermined.

The condition of being unsusceptible to the inroads of an infective disease, or, in other words, immunity may be either natural or acquired. Thus the bacillus of septicaemia which is uniformly fatal to house mice has no effect on field mice, and the ordinary sheep falls the easy prey of anthrax, while Algerian sheep are infected with great difficulty.

Then again there is the well known fact that one attack of a contagious disease usually protects from a second attack of that and of allied diseases. This acquired immunity may last for a life time, as in the case of small pox, or it may last for a comparatively short period. Thus immunity can be conferred against anthrax and hog cholera by the inoculation of attenuated cultures of the respective bacilli, which produce the diseases, but the immunity so conferred does not last longer than one year. In the case of these two diseases the risks of making the inoculation are so great and the period of immunity so short the practice of preventive inoculation has fallen into disuse.

Various explanations of the condition of immunity have at different times been offered.

First, there is the tolerance theory of the American bacteriologist, Sternberg. He claimed that the system acquired an adaptiveness to the disease in the same way that a person can become tolerant of morphine, alcohol or tobacco, and probably in regard to several diseases, at least, there is a considerable tincture of truth in the idea.

Then there is the exhaustion theory of Pasteur who supposed that by the first attack the system has been drained of certain substances which were essential to the life of the bacteria, and that consequently second attacks cannot occur until this *fabulum* has again been restored.

Lastly, there is the retention theory of Chaveau, who

claims that during the first attack of a contagious disease the bacteria generate in the system certain substances inimical to themselves, which are retained, and which fortify the economy against subsequent inroads of the disease.

Viewed in the light of recent discoveries in connection with protective inoculation and anti-toxines this idea of Chaveau offers the most reasonable explanation of immunity so far advanced, and very naturally leads us to the consideration of the products of bacteria and the uses to which these products are being put.

After pathogenic bacteria gain entrance to the animal system they live for a variable time in a quiescent or dormant state. At the expiration of this so-called period of incubation, they begin to grow and multiply and coincident with their growth and multiplication is the appearance of the symptoms and phenomena of disease.

These symptoms and changes are brought about to some extent by the direct disintegrating power which the bacteria exert on the blood and tissues of the body, but to a much greater extent by the formation of ptomanes, enzymes or ferments, and poisonous albumins called toxines.

Thus cultivation of the bacilli of cholera and of typhoid fever results in the formation of tox albumins which, when injected into healthy animals, produce the symptoms of the respective diseases.

Again cultivation in a suitable medium of the tetanus bacillus results in the generation of a substance, tetanin, which, when injected into guinea pigs, produces rapid breathing, tetanic convulsions and death. A peculiar feature of these tox-albumins is the fact that many of them are inimical to the life of the very bacteria which produce them. They are to some extent themselves antiseptics, and it is by taking advantage of this peculiarity and by using the tox-albumin in a modified form that the anti-toxine treatment of disease has originated. Perhaps the best example of an anti-toxine that we so far have got is the anti-toxine of diphtheria.

The first step in the process is to obtain the diphtheria toxine, or in other words the poison which the diphtheria

bacillus manufactures during its reproduction and growth. The toxine having been duly obtained, the next step is to so modify it that it will be harmless to the human subject into which it is injected and yet retain its power of acting as an antiseptic to the original bacillus.

This modification is obtained by passing toxine through the body of a living animal. The fact that the horse is very tolerant of the poison of diphtheria, that he can withstand having large quantities injected into his system, without serious impairment of health, has led to his adoption as a medium for the preparation of this anti-toxine. A perfectly healthy subject is selected and the sterile diphtheria poison is hypodermically injected. At first the dose is very small and causes more or less systematic disturbance. The amount injected daily is steadily increased and the animal's system saturated with it, until a point is reached where the blood is found to be of the potency or strength suitable for use in human practice. Such an animal is said to be immunised and the length of time which it takes to reach this point by this method is about ninety days. Klein in England employs a modified form of obtaining anti-toxine. He injects the living bacilli into the horse, at first using attenuated cultures and later more virulent cultures, and in this way claims to immunise an animal in twenty-three days.

The subject having been immunised, blood is drawn, allowed to coagulate, and the serum thus separated, now called anti-toxine, is collected in sterilized bottles and is ready for use. This serum can also be dried in vacuo and reduced to powder, being thus more convenient for transport. It has merely to be dissolved in water to be ready for use. As its name anti-toxine would suggest, it not only has a detrimental effect on the diphtheria bacillus but also has an antidotal influence upon the toxine they manufacture.

The agent is employed hypodermically and usually at intervals of twelve hours until three or four injections have been given.

In genuine cases of diphtheria the effects of the treatment

are produced with great regularity and have been summarized as follows:

(1) Diminution of the faucial swelling and of the consequent distress;

(2) Lessening or entire cessation of the irritating and offensive discharge from the nose;

(3) Limitation of the extension of membrane;

(4) Earlier separation of the exudation;

(5) Limitation and earlier separation of membrane in laryngeal cases;

(6) Improvement in general condition and aspect of patients;

(7) Prolongation of life, in cases which terminate fatally, to an extent not obtained with former methods of treatment.

Now whither is all this leading us? Every indication points to the ground that a genuine principle has been discovered. Already a tetanus anti-toxine has been prepared which has achieved a modicum of success. There is room for believing that an antidote for toxic infection is being discovered. Koch has produced a new tuberculin which gives hope that the dreaded tuberculosis will yet be brought within control, and as the knowledge of our Liliputian enemies becomes more thorough, and as our facilities for engaging them in combat with themselves become more perfect, the future shines brighter and brighter with promise that the day is near at hand when we shall have an efficient and to some extent a natural remedy for all these blights and scourges from which the world has so long suffered.

## MALIGNANT CATARRH OF THE OX,

BY DR. A. YOUNGBERG.

MR. PRESIDENT: The old authors call this disease "Malignant Catarrh of the Ox." Some of our more recent and fashionable authorities have re-baptized it and are calling it "Bovine Influenza."

Malignant catarrh of the ox is an infectious disease, affecting all ages and all conditions of cattle, but is perhaps more common among young and thrifty stock. It is probably contagious, but does not spread rapidly or widely.

Inoculation experiments have thus far given indefinite and unsatisfactory results. Dr. Bursasco experimented with discharges from pituitary, nasal and buccal membranes, and also with blood from affected animals. He introduced these upon various mucous membranes, and injected them into the blood current, without satisfactory results. A certain German veterinarian insists that the disease is distributed around in that country by butchers, who travel from place to place buying stock, but this has not been supported.

The disease affects all the mucous membranes but most uniformly the mucous membranes of the respiratory, digestive and optic organs.

## ETIOLOGY.

The etiology of this disease has not been demonstrated, but it is believed by some of our best authorities to be due to a bacterium. This disease does not seem to spread widely or rapidly, but usually appears in isolated and consecutive outbreaks of small proportion. Little is known of the predisposing causes, although the authorities have theorized upon it in various ways. One authority claims that the disease is favored by damp and poorly ventilated stables; another insists that food and water containing a supera-



bundance of earthly alkalis, such as are found on the alkali plains, may have a predisposing tendency; and still others insist that the trouble is due to pasturing on marshy ground; others to unusual changes in the temperature.

Suspected pastures should not be used for cattle during the summer, and should be burned over in the fall, as soon as the grass is sufficiently dry. The yards and sheds, or stables, should be cleaned as thoroughly as possible, and kept vacant for as long a period as possible. If the animals which recover were affected with a complication of pustular eczema, they should always receive an antiseptic wash before being returned to the clean lot or pasture, otherwise the disease is apt to recur in from three to four weeks, at which time, perhaps, an animal is affected, and this one lingers along for some time, and then a few more cases occur. The disease is apparently spread at times by neighboring farmers visiting the diseased stock, perhaps handling or otherwise examining them, and then going back home and taking care of their own cattle. Such an owner may be surprised to find in the course of about three weeks some of the same trouble among his own cattle. Since this disease does not spread widely or rapidly it does not seem necessary in Minnesota, at least, to make any special sanitary regulations concerning it.

#### HISTORY AND SYMPTOMS.

This disease respects neither age nor condition, and may appear at any season of the year. I have seen it more commonly in the fall, but its virulence seems greatest in midwinter. The first symptom which I have been able to observe has been a chill lasting from one to twenty-four hours, the chill being apparently in proportion to the virulence of the attack. On the first or second day the temperature rises from perhaps 103 to 107 F., the animal is depressed, head supported, perhaps on the manger, or hanging almost to the ground. The base of the horns, cranium and region of the sinuses feel hot to the touch. There is noticeable muscular trembling; the back is arched and all four feet gathered closely under the body. The animal is listless, paying little or no attention to the surroundings; muzzle dry and hot,

with a saffron color. The milk flow diminishes day after day; according to the severity of the attack, until it is nearly or quite suppressed, and there is a rapid and general emaciation. Symptoms shown by the eyes are very characteristic; there is an abundance of tears running over the face which later causes removal of the hair along its course. The conjunctiva is red and congested; lids swollen, hot and tender. Photophobia is marked; the animal seems to fairly dread light. If the acute conjunctivitis continues unchecked, the cornea becomes faintly cloudy or even milky white; the aqueous humor may also lose its transparency, and we then have a condition arising which may properly be called glaucoma. Acute iritis may also appear. Ulcerations may appear upon the cornea, Schneiderian membrane, or in the mouth. There is frequently coughing, which is apparently quite painful. The discharge from the nose is at first watery, but later becomes muco-purulent, and if the disease takes a fatal course, we find erosions of the nasal membrane. The nasal discharge is very offensive and streaked with blood. I regard this as positive evidence that the severe catarrhal condition has invaded the frontal sinuses, and there is necrosis of the turbinated bone. In this case the head, about the frontal sinuses, and around the horns is hot, and the horns break off very easily. When the disease has advanced thus far the animal shows extreme difficulty in breathing and the cheeks are bulging in and out at each respiration. As the disease attacks the digestive organs we find at first loss of appetite, mouth swollen and hot, and a profuse flow of ropy saliva. The inflammation frequently extends forward to the nasal pad and causes desquamation of that organ, and there is pustular eczema at the junction of the nasal pad with the skin. The inflammation may extend backward and involve the pharynx and larynx and thus cause the noisy breathing which is often heard in this disease. When examining the buccal cavity we cannot help noticing the extremely offensive odor which exhales. There is usually marked constipation during the first four days of the attack and at this time the feces are hard, but when the inflammation is extended to the stomach and intestines, there appears a very foetid diar-

rhoea, at the commencement of which the animal is kicking at the belly as though effected with colic. The discharges contain shreds of the ulcerated mucous membrane and are streaked with blood; tenesmus is quite marked. The rectal mucous membrane is very much tumified; urine has a saffron color, disagreeable odor, and is passed only after several attempts and with pain. Pregnant animals generally abort if the attack is severe, and the foetal envelopes are usually retained. Their removal causes great pain, and is not easily done, because the walls of the uterus are swollen and painful, and the adhesions are very firm. The manual manipulations causes the cow to strain and groan and show extreme pain.

When the disease has existed about twenty-one days and is to be a fatal case, we may find cerebral hyperæmia, as shown by restlessness, climbing into the manger, leaning over against the wall, and perhaps falling sideways. The eyes show a haggard expression. When this condition has existed from about twenty-four to seventy-two hours, we find the congestion is followed by paralysis and coma; temperature falls to 98° and then death is near at hand. In certain cases when the cow has aborted from this disease and the placenta has not been removed we find pustular eruption of the skin over the udder, in the flexures of the joints and at the junction of the skin with mucous membranes, and in one case where the cow fell and died suddenly, the hoofs were easily separated from one foot and the os-pedis covered with a foeted pus.

#### PROGNOSIS.

If the animal is not pregnant, and appetite good and excretory organs acting normally, the prognosis is favorable; while if the patient is pregnant and there is loss of appetite, drooping of the head and difficult breathing, the outlook is not favorable.

#### POST MORTEM.

I have found that the mucous membranes uniformly show pathological changes; but they may vary all the way from simply congestion to sphacelation; small ulcers on the septum-nasi and vomer, and the frontal sinuses and horn matrix filled with pus. Croupous deposits are often seen in

the pharynx and larynx, and there may be fatty degeneration of the kidneys. If the animal has aborted, the uterus is filled with a black, foul smelling fluid; the uterine walls are congested and the cotyledons are undergoing suppurative changes; the walls of the fourth stomach and intestines are very much thickened and of a black or purple color, the muscular coat being almost denuded in places, and after the diarrhoea has existed for some time the peritoneum shows localized inflammation.

#### TREATMENT.

Cathartics and heart sedatives only hasten the fatal termination. I have had best results from a mixture of F. E. Gentian; F. E. Nux Vomica and Spts. Eth. Nit. given in beer three times a day, and the patient fed on sloppy food. Good results are secured from steaming the head with a mixture of water and turpentine, and as there is always constipation in the first stage of the disease, I empty the bowels by injections of soap and water, and just as soon as diarrhoea sets in I replace the Gentian, Nux Vomica and Spts. Eth. Nit. by Tr. Opii and Arom. Sulph. Acid. Bathe the eyes three times a day with dilute aqueous solution of sodium chloride, and when the cloudiness appears in the cornea and aqueous humor, I smear into the eyes once a day a little of the following:

Zinc oxide.  
Thymol.  
Cocaine hydrochlorate aa grs. iii.  
Camphor grs. ii.  
Petrolatum oz. i.

Applying it on the inside of the eye-lids after bathing with warm salt solution.

## THE ACTUAL CAUTERY,

BY DR. WM. DOUGHERTY.

It is not my intention to give you the history, or the different modes of using the actual cautery, but will confine myself to the use of it in chronic hip and shoulder lameness.

Five years ago last March, there was sent to me a brown horse, lame in the near hip, which had been lame for twenty-two months, and had been treated by several practitioners.

When he arrived at my place, he was the lamest horse I have ever seen; the muscles of the gluteal region were so much atrophied that you could see the articulation. He had been blistered several times, and also had had seatons put in him; the last treatment he received was that of a homœopathic practitioner, and consisted in the administration of internal medicines. I informed the owner that I did not think it worth while to do anything more, as I would give no hopes of recovery; but the owner insisted that I should try.

I thought the matter over, and it came to my mind that in all the cases of hip lameness I had ever seen recover from the use of a blister, there was a slight amount of pus exuded from the region of the joint, and it then occurred to me that the points of the actual cautery would be the proper treatment. I fired him, making five points; one directly over the joint, and four surrounding it, about two and a half inches from center point. On top of that I put a cantharides oil blister, one to six.

The result was a free discharge of pus from all of the five points; after ten days, he commenced to improve. That constituted all the treatment, save rubbing the muscles of the hip with white spirits every day.

He made a complete recovery by the first of August, and

has remained well to this day, five years and six months. There were two other cases of hip lameness, one of shoulder lameness, that were nearly as bad as the one I have just cited; they also made complete recoveries. The balance of the cases, (twenty-eight,) making thirty-two in all, were not so bad. In some of the milder cases, I used but one point of the cautery, and that directly over the joint; in all cases using the cantharides oil blister.

I use a very large and heavy iron with a sharp point. When the muscles are heavy, I fire about one and a half inches deep; when there is much atrophy, I do not fire so deep.

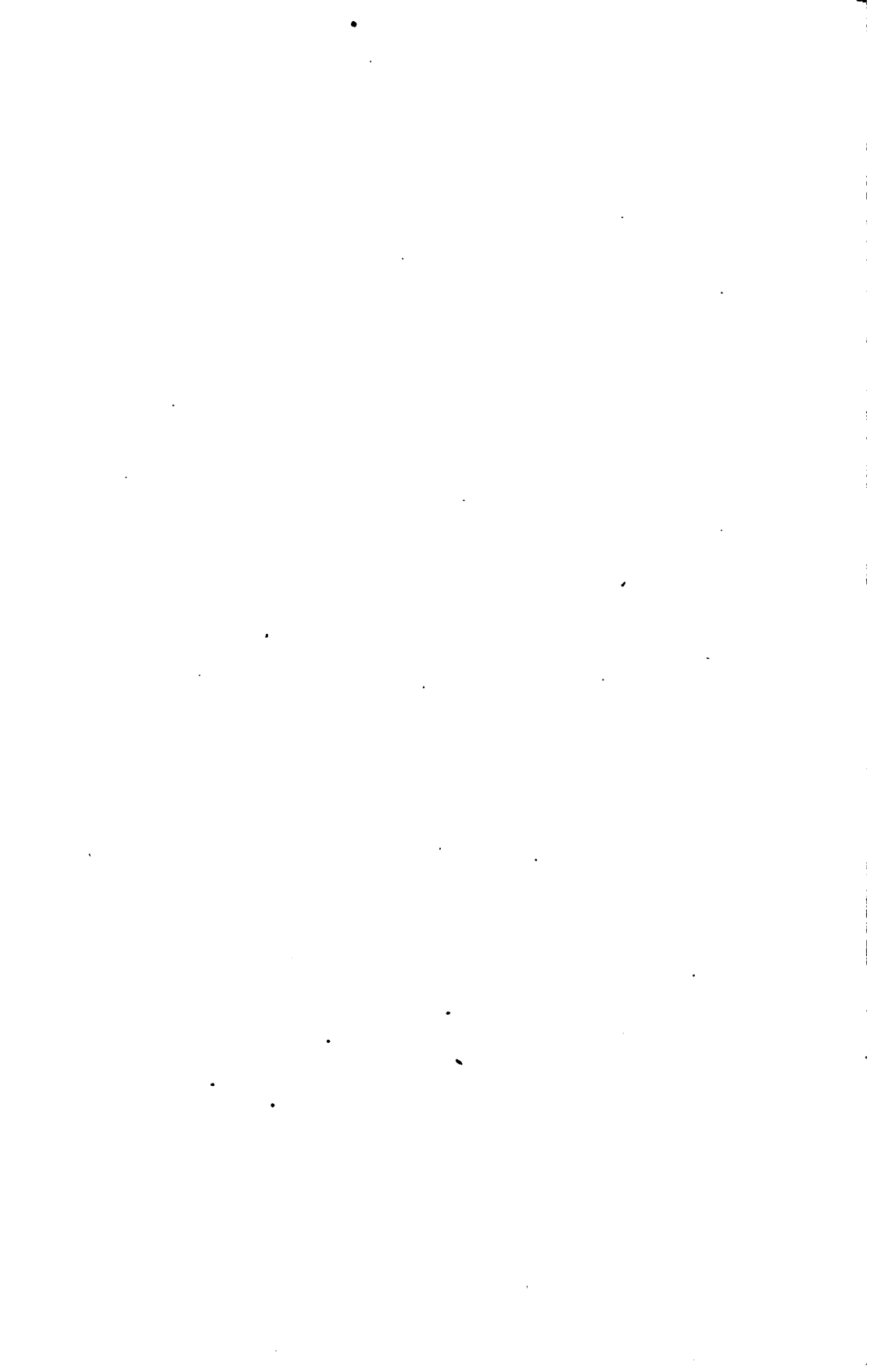
I have used on two occasions, the thermo cautery, but do not like it for this particular operation, as it does not carry heat enough, and cools off in the muscle.

I have also used the large points in cold abscess, fibrous tumors, and in the first stage of fistulous withers.

Have used the corrosive sublimate blister, and have had better results than from any other form of treatment.

In this short paper, I will not advance any theory of the treatment. I have abandoned the superficial use of the cautery for twenty years; that is, the firing with straight irons, having seen hundreds of cases of superficial firing with no beneficial results, but leaving large cicatrices that were eye-sores.

This is a subject that will bear a great deal of thought and investigation, as it is one of the oldest forms of treatment in veterinary practice. I trust that at our next meeting many of our members who are more capable and able, will give it ample thought and better elucidate it to the members of this Association.



PROCEEDINGS

OF THE

ANNUAL MEETING

OF THE

Association of Veterinary Faculties

OF NORTH AMERICA.

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HELD AT

NASHVILLE, TENNESSEE,

SEPTEMBER, 1897.



OFFICERS.

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PRESIDENT,  
DR. LEONARD PEARSON.

SECRETARY-TREASURER,  
DR. H. D. GILL.

EXECUTIVE COMMITTEE,  
DR. JAMES LAW,  
DR. M. STALKER,  
DR. D. McEACHRAN,  
DR. D. E. SALMON,  
DR. JAS. L. ROBERTSON.

## MINUTES OF THE PROCEEDINGS.

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TULANE HOTEL, NASHVILLE, TENN., 8 P. M., September 8th, 1897.

The meeting of the Association of Veterinary Faculties of North America was held at above place and date during the meeting period of the United States Veterinary Medical Association.

Dr. Pearson in the chair.

The following colleges were represented :

Harvard University,.....	Dr. F. H. Osgood.
American Veterinary College.....	Dr. R. R. Bell.
New York Veterinary College,.....	Dr. H. D. Gill.
University of Pennsylvania,.....	Dr. Leonard Pearson.
Columbian University,.....	Dr. D. E. Salmon.
Kansas City Veterinary College.....	Dr. S. Stewart.
McKillip Veterinary College,.....	Dr. F. S. Schœnleber.
Cornell University,.....	Dr. James Law.
Iowa Agricultural College,.....	Dr. M. Stalker.
United States Veterinary College,.....	Dr. C. B. Robinson.
Ontario Veterinary College,.....	Dr. D. K. Smith.
Chicago Veterinary College,.....	Dr. A. H. Baker.

Drs. Hoskins, McKillip, Clement, and Parker were also present, the last two being invited to be present as representing McGill University, unofficially.

On motion of Dr. Stewart, seconded by Dr. Baker, the minutes of last meeting were approved as read.

The Executive Committee reported favorably on the application of Dr. R. R. Bell, American Veterinary College; Dr. Greiner, Indianapolis Veterinary College; Dr. Smith, Jr., of Ontario Veterinary College; and Dr. F. S. Schœnleber, McKillip Veterinary College. Drs. Clement and Parker not being eligible to represent McGill University (not of the faculty or teaching staff) were reported unfavorably. Mo-

tion of Dr. Baker, seconded by Dr. Stewart, that those representing other schools but not eligible to vote, be invited to attend the meeting during reading of papers and the discussion of the same. Carried.

REPORT OF COMMITTEE. Drs. D. E. Salmon and James Law on "Uniform Standard of Entrance Examination." Dr. Salmon reported that he had no report on the subject but that Dr. Law had. Dr. Law read his report and it was discussed at length by every member present, and the discussion waxed so warm that Dr. Law protested to the very pointed and personal remarks of Dr. Robinson, who was repeatedly called to order.

When asked if the report of Dr. Law expressed the ideas of the whole committee, Dr. Salmon answered the Chair that it did not and that he would present one at the next meeting. On motion Dr. Law's report was accepted after it had been explained that acceptance does not imply an endorsement of the views expressed.

On motion further discussion was postponed till after the reading of Dr. Hoskins' paper on "Uniformity of State Regulations Governing the Practice of Veterinary Medicine." Both papers were freely discussed; the prevailing opinion seemed to be for uniform entrance examination. On motion Dr. Hoskins's paper accepted.

Motion by Dr. Osgood, seconded by Dr. Schœnleber, that a committee of five as follows: Drs. Osgood, Law, Salmon, Schœnleber, and Bell, be appointed to report at the next meeting on the advisability of forming a "National Examining Board," was amended by Dr. Salmon, seconded by Dr. Bell, that a provision should be made for a co-operation with state associations to secure a uniform provision in legislation authorizing the examining board to establish the standard of examination and to accept the certificate of other boards that have satisfactory requirements. Motion as amended were carried.

The following amendments to Articles I and II of the Constitution was proposed by Dr. Pearson:

*Resolved*, That Article No. I be so amended as to read:

This body shall be known as "The Association of Veterinary Faculties and Examining Boards of North America."

That Article II be so amended as to read: "This Association shall consist of members of governing faculties and teaching staffs of all Veterinary Schools of North America which confer a degree in Veterinary Science, and of members of State Veterinary Examining Boards that grant licenses to practice, but each College and Board shall have but one vote in the meeting and that vote shall be cast by the properly appointed delegate of the School or Board."

The President ordered it to take the regular course.

The election of officers being in order, on motion of Dr. Robinson, seconded by Dr. Osgood, the present incumbents were declared re-elected, and the Secretary cast the ballot as follows:

Dr. Pearson, President; Dr. Gill, Secretary-Treasurer; Drs. Law, Stalker, McEachran, Salmon, Robertson, Executive Committee.

Motion of Dr. Osgood, seconded by Dr. Robinson, that minutes of meeting and papers be published in the report of the United States Veterinary Medical Association, carried.

Meeting adjourned.

## REPORT ON MINIMUM STANDARD OF ENTRANCE EXAMINATIONS,

BY DR. JAMES LAW.

In approaching the question of matriculation examination we are confronted by two considerations which are essentially antagonistic in their natures.

First. For the great body of veterinarians the emoluments of the profession are often too small to warrant a great outlay of time and money in preparing to enter it; and the man who has spent his early life in some occupation connected with the care of animals, has acquired a special aptitude in handling and caring for them, but has rarely the means requisite for an extended course of study.

Second. On the other hand the lack of preliminary education places a handicap on the efforts of the candidate not only during his college career but during his whole subsequent professional life. The nomenclature is for the ignorant a meaningless jargon with which he must struggle laboriously, word for word, without one ray of philological light to help the jaded memory. In the modern class, say of chemistry, he is called upon to face and solve problems for which a knowledge of mathematics is an essential prerequisite. In pathology and bacteriology, without which there can be no scientific medicine, he must lay the foundation of a knowledge of the microscope for which physics is indispensable. In materia medica, if ignorant of botany, he must fail to grasp and utilize the families, orders and genera which furnish a key to physiological and therapeutical use.

If he knows nothing of geology he is debarred from the intelligent study and prophylaxis of enzootic diseases, due to mineral impregnations of water and food, or to the prop-

agation of given fauna or flora, and the diffusion of given organic poisons, on particular formations. Turn where we will, we find the way barred to the candidate who is unprepared or poorly prepared, and open and inviting to him who comes armed and furnished.

A no less important consideration is this, that the mind that has been already trained to habits of study and reasoning has capacities to which the untrained mind is an entire stranger. From a long experience in teaching students in the different years of their university curriculum, from the first to the fourth, students who had all entered under the test of a severe matriculation examination, I have learned that *cæteris paribus*, the students of the third and fourth year were far superior to those of the first and second. I have also learned that those who have entered as special students without matriculation examination have in their turn fallen far behind the students that entered by such examination, and too often they have been compelled to relinquish their efforts and drop out of the University without even completing a single year of study.

I speak now of the rule, not of exceptional cases. Two men of equal mental capacity as a native gift, coming to the same task, with minds respectively disciplined and undisciplined, met with success and failure, in accordance with the measure of such previous discipline.

The exceptionally brilliant man is likely to succeed in spite of every obstacle, to grasp readily what is beyond the reach of the common mind, to learn how best to secure for himself the preliminaries, that will enable him to deal with the more difficult problems, and increasing his mental strength by patient, earnest, and well directed effort, he may distance those who started with far better preparation, but without his mental capacity. But even he would have done better work if he had accomplished this preliminary study before he entered on his college course. His whole energies could then have been expended, intelligently, from the first moment, on his professional studies and the same mental outlay would have secured a double or treble return.

The great majority of our students are not men of genius,

and it is a poor economy to sacrifice the great body of the rank and file, because one great genius can afford to dispense with certain stepping stones to success, or rather can find for himself the stepping stones which we should have provided. The time lost even by the genius in finding and placing the stepping stones has lost to him, for the time being, much that he should have been free to garner at once.

But, it may be claimed, the supposed genius could not possibly secure both the necessary school preparation, and the professional education. He would have been lost to the profession if the preliminary education requirement had been enforced. On the other hand it may be argued that if he had not the courage to face the preliminary work in the regular way, he showed himself to be lacking in that virtue of perseverance which is so essential to success in after life, and if so, even his exceptional powers in other directions might fail to compensate for the fundamental defect. It is easier for him to take these preliminary studies under experienced teachers, than to dig them out alone with many a blunder and stumble. The exceptional man may fit himself for veterinary practice without the aid of a college at all, but none of us would advocate such a course on the ground that he has neither means nor leisure. As teachers it is our duty to provide the education which is best all round, for the average candidate first and for the man of extraordinary ability as well. We cannot afford to sacrifice the average man, to the possibilities of the genius, and we cannot afford to dwarf even the genius, because that under unfavorable conditions he can compare favorably with the average.

Choose what course we will, we shall turn out a large number of men of common powers, and occasionally one of unusual ability. The question with us must be: What is best for the future of the profession, and for the great live stock and national interests involved in this? Can we secure and hold the confidence of the general public and of the government by turning out a large body of men who will do the profession meagre credit, and delay the time when they will take their true position in the fields of sanitation and medicine? The sister profession has generally

taken the position that an educated and disciplined mind is essential to the study of medicine. We have an even wider field than theirs and if we lag behind, and act on the assumption that a mere superficial training will suffice for the medicine of the lower animals, can we blame legislators if we find what is essentially veterinary work entrusted rather to the medical profession. Few members of the medical profession are at all fitted to deal with the diseases of animals, but if the legal requirements for that profession are a well educated and disciplined mind, and a thorough course of medicine, it must not surprise us if the lawmakers entrust veterinary sanitary matters to the disciplined and accomplished profession of medicine, and refuse to entrust them to the comparatively undisciplined and unaccomplished profession of veterinary medicine.

Even for medicine this legislation for preliminary education and discipline is new, and the great body of existing physicians, are in no sense guaranteed by it, but the very fact that this demand is on the statute book reflects on all and furnishes a general standard which is by no means justified by the facts. The medical fraternity which have come down to us from the past, profit by the assured legal status of the medical graduates of the future, and if we would hold our own proper place in public estimation, we too must see that our profession has provided for a similar advance. To impose the duties of the veterinary sanitarian on the physician is a great wrong to the community, and it is little to the credit of some members of the medical profession that they cling tenaciously to offices which they are by no means fitted to fill, but on the other hand, if we would aspire to do our full duty to the people, we must furnish the men who in mental discipline, in profound pathological training and in special veterinary skill, are fully competent to deal with the questions involved.

Our delinquency in this respect tends to undermine the success of the medical man who trenches on our special field, for he has always to fall back on the veterinarian to do the actual practical field work, and in proportion to the inefficiency of the latter will be the inefficiency of his superior.



But in such a case the odium falls necessarily and justly quite as much on the veterinary as on the medical profession, for whatever may be the shortcomings of the medical chief, they must attach also to the veterinary representative in the field, and these the latter must bear in addition to all his own personal faults and failures. In the same way an inefficient worker in the field must negative to a considerable extent the best direction received from a veterinary chief so that in any case to insure success we must have our veterinarians thoroughly educated in order to accomplish satisfactory work.

This seems to be much better understood by the veterinary educators of the Old World. To satisfy myself on this point, I have placed side by side the matriculation demands of the European and American Veterinary Colleges, and I must say that the exhibition is not at all calculated to flatter our national pride.

In *EUROPE* the candidate for matriculation must meet the following demands:

In *France*. He must be bachelor of letters or sciences, bachelor of special secondary education, or a graduate of a national school of agriculture. If a special examination is called for it includes the elements of physics, chemistry, botany, zoology and geology.

In *Germany*. He must furnish a certificate of admission to the highest professional class of a gymnasium, or to the highest Latin one, or an official certificate of a full equivalent. (Latin is obligatory).

In *Austria*. He must have passed the first six classes in a gymnasium (the whole course is eight classes), or as an equivalent he must pass in German, physics, chemistry, natural history, geography history, and algebra.

In *Russia*: He must have passed the first six classes in a gymnasium; or the full course in a seminary or professional school. (Latin always obligatory).

In *Italy*: National literature; algebra; elementary geometry and physics; or the license of a lyceum or technical school.

In *Spain*: Arithmetic, algebra and geometry.

In *Portugal*: Portugese, French, Latin, arithmetic, physics and chemistry.

In *Sweden*: The six first classes in primary education.

In *Hanover*: Certificate of admission to an advanced Latin school, a first-class professional school, or a seminary. (Latin obligatory).

In *Denmark*: Danish and two other tongues (English, French, German), mathematics, physics and natural history.

In *Holland*: Dutch, German, French, and mathematics.

In *Switzerland*: French and German (or a second living tongue), Latin, geography, mathematics, natural history, physics, and chemistry.

In *Hungary*: First six classes in a gymnasium, Hungarian, mathematics, natural history.

In *Belgium*: Flemish; the degree of an university, or of a normal school, or of a course in arts, or of an atheneum, or of a state commercial college, or sufficient to admit the candidate to the special schools connected with an university or state military school.

In *England*: English, arithmetic, geometry, algebra, history, Latin, and one of the following: Greek, French, German, Italian or Spanish.

In *AMERICA* the demands are as follows:

In *New York*: A four year high school course representing forty-eight regent's counts.

In *New York State Veterinary College*: A four year high school course, or English, geography, physiology, plane geometry, algebra through quadratics, United States history, and any three of the following: Latin, Greek, French, German, physics, botany, geology, vertebrate zoology and invertebrate zoology.

In *Ohio State University, Veterinary College*: a. For veterinary surgeon: arithmetic, geography and grammar. b. For doctor of veterinary medicine: arithmetic, grammar, descriptive and physical geography, English composition and rhetoric, history, Latin, physics.

In *Harvard Veterinary College*: English branches and one of the following: Latin, French and German prose, plane geometry and zoology.

In *The University of Pennsylvania, Veterinary Department*: English grammar, orthography and physics.

In *Iowa State Veterinary College*: English grammar, orthography, arithmetic, physiology and United States history.

In *McGill University, Veterinary College*: Orthography, arithmetic, geography, English composition.

In *Kansas City Veterinary College, McKillip's Veterinary College* and *United States College of Veterinary Surgeons*: The education required by the Association of American Veterinary College Faculties.

In the *National Veterinary College*: The ordinary branches of an English education.

In the *Veterinary Department, Detroit School of Medicine*: English branches.

In *Chicago Veterinary College* and *Indiana Veterinary College*: Common school education.

In the *University of California, Veterinary Department*: A written examination; scope not intimated.

In the *Ontario Veterinary College* and the *Ohio Veterinary College, Cincinnati*: Reading, writing and spelling.

The only American examples which at all approximate to the European Colleges are those of New York where a four years' high school course is now demanded by law, and the Ohio State University, College of Veterinary Medicine, which for its veterinary doctorate demands, arithmetic, grammar, descriptive, and physical geography, English composition and rhetoric, history, Latin and physics. To some extent the Ohio school amends this honorable standard by offering the degree of veterinary surgeon on a matriculation in arithmetic, geography, and grammar only. With a veterinary degree of this university to be obtained on this lower plan, it would not be wonderful if the candidates for the higher degree were few and far between.

The contrast between the requirements in the European and American schools becomes still greater when we consider that the college curriculum in Europe is almost invariably one of four years of eight or ten months each, while most of our schools have just adopted a three year course of six

months each. Five only of our American colleges, Harvard, Iowa, Ohio, New York State Veterinary College and Pennsylvania, have an academic year of nine months. For the remaining eleven the whole curriculum covers but eighteen months as contrasted with the thirty-six months standard of the European schools. Even our five *advance guard* schools with their three years' course of nine months to the year, represent but three-fourths of the curriculum of the European schools. And outside New York and Ohio, the preliminary requirements bear no ratio to the demands for matriculation in Europe. The one American college which in its requirements will bear comparison with the European is the New York State Veterinary College. Its matriculation examination is more exacting than that of the Royal Veterinary College of London, but its curriculum is still five months short of that of the London school. If it shall attain to its coveted four years course, it will exceed that of London by four months, and may then claim to stand as the equal of any school of the world.

These facts are not adduced in any invidious sense. They are however, germane to the question before us and that question cannot be solved in any satisfactory way without looking these facts squarely in the face.

If our college curriculum is far short of that of the European veterinary schools, we cannot afford to add to its inferiority, by seeking to defeat any attempt at improving the woefully inadequate matriculation examination. If we cannot at once extend our curriculum in the direction taken by the European schools, we can at least raise our matriculation requirements so as to secure the best results from our confessedly too short curriculum. It is impossible to grade down, we must henceforth grade up. If, for example, the graduates of schools outside New York wish to practice in the Empire state they must see to it that their alma mater has had a matriculation representing four years of academic work equal to that demanded by the regents of the high schools of New York, and that this has been followed by three years of professional study equal to that demanded in the veterinary schools of New York. To admit practitioners

from other states, would be to place a premium on the lower requirements, to aim a deadly blow at the New York state schools, and to foist upon the stock owner of New York veterinarians of a less educated class, when the statute provides that they shall have the best. New York cannot recede from the position she has assumed. Any such proposal will be successfully resisted by the veterinarians and stock owners of the state. The legislature could not think of such a thing as it would be a direct act of hostility to the veterinary colleges of the home state and to the high status to which the statute holds them.

The same remark applies to any other state which requires a higher standard for its veterinary practice than that of adjacent states. To hold its own native practitioners or graduates to a high standard, and to admit practitioners from outside on a lower standard would be to the last degree unpatriotic and injurious. The state must either have no law regulating the practice of the profession or it must apply such a statute with inflexible justice, and above all, it must not administer it in favor of the alien as against the citizen.

The difficulty of an equitable adjustment comes from the fact that we are a federation of independent states. Congress cannot impose on the states a common standard of veterinary education and practice. The only harmony attainable must come from the adoption of a common standard by the different state licensing bodies, and by an agreement of such official bodies to accept at their face values the licences granted under government authority in the sister state. To do more than this would be to shatter at one blow the superstructure which has been laboriously secured in the different states for the elevation and improvement of the veterinary profession, and to restore the chaos and confusion of fifteen years ago.

So long as the requirements in the different states vary as much as they now do, the best that can be done will be to let the states arrange themselves in groups having parallel requirements, and let the licenses granted in any one state be accepted in all the other states belonging to the same

group, while if any practitioner should desire to practice outside the states of his own particular group, he must accommodate himself to the standard of the state of his adoption, and if that standard is higher than in his former home, he must meet the extra requirements, or forego the desired change.

The only possible minimum requirement which will entitle to a license to practice in all states alike, is the highest standard set in any one of the federated states, and to secure a common standard all must reach up to that level.

REPORT ON UNIFORMITY OF STATE REGULATIONS  
GOVERNING THE PRACTICE OF  
VETERINARY MEDICINE,

BY DR. W. HORACE HOSKINS.

MR. PRESIDENT AND MEMBERS OF THE ASSOCIATION OF FACULTIES: In presenting to you this brief review of the efforts put forth during the past year to secure by state enactment, such legislation as would best conserve the interests of the profession in the several commonwealths of our country, and thus ultimately lead to some single plan partaking of a national supervision of veterinary degree conferring power, I shall have but little to offer you as the outcome of this work, but more to draw from in what it has presented as obstacles preventing the attainment of our wishes.

The following states during the past year presented to their legislatures, bills looking to registration of all practitioners of veterinary science and the granting of licenses to all future practitioners wishing to enter upon practice in these states:

COLORADO. A proposed bill for the appointment of a Board of Examiners; also the registration, examination and licensing of graduates. Non-graduates able to prove having practiced in the state for five years previous to passage of law, allowed to register within ninety days after bill has been adopted. Failed to pass. Reasons for the same—lack of united influence of veterinarians. Insufficient number of veterinarians in the state. A wrangle in the legislature which caused a deadlock was also a potent influence.

**NEW HAMPSHIRE.** A proposed act requires registration of veterinarians after July 1, 1897. Satisfactory examination required before an appointed Board of Examiners, consisting of three persons, who must be members of the State Association. This bill failed for no other special reason than lack of united efforts of the veterinarians of the state.

**PENNSYLVANIA.** A bill introduced for the examination of horse-shoers before allowing them to register or receive a license.

**INDIANA.** Desires the consideration of a statute to regulate the practice of veterinarians. This bill failed.

**MINNESOTA.** The bill providing for a Board of Examiners was revised and must now be composed of legally authorized graduates from recognized schools. Graduates must submit their diplomas and must pass any required examination before the Board. Non-graduates are not permitted to appear for examination. These amendments to the law in force in Minnesota, make their provisions among the best in the land, for the encouragement of higher veterinary education.

**CONNECTICUT.** Bill for registration and establishment of a State Board of Examiners. Defeated by lower branch of legislature. Lack of united support among the veterinarians. The state society not strong enough or sufficiently united.

**MICHIGAN.** State legislature failed to pass bill to provide for State Board of Veterinary Medical Examiners and better regulation of practice of veterinary medicine. The same causes operated here, lack of organized support and those directed to present this legislation had not the advantages of a needed organized profession back of them.

**WISCONSIN.** Bill to regulate practice of Veterinary Medicine, Surgery and Dentistry. Only graduates of legally chartered schools can register, others must pass examination before an appointed Board of Examiners. This bill failed to pass in part because its provisions while desirable were too stringent, and again lack of hard work on the part of those most interested.



**NORTH CAROLINA.** A bill to regulate the practice of Veterinary Medicine and Surgery. To prevent delay and inconvenience, two members of the Board of Examiners may grant a temporary certificate to practice veterinary medicine or surgery, which shall be in force only until the next regular meeting of the Board of Examiners, but in no case shall such temporary certificate be granted to any person who has been an unsuccessful applicant for a certificate before the Board.

In all of these states the efforts proved fruitless of results, except Minnesota, and I shall review briefly the reasons therefor. In each of them, under your direction, I placed myself in communication with those directing these movements, and so far as possible secured the adoption of a general plan, consisting of an appointed Board of Examiners of graduates of recognized schools, and that said Board would also act as a Board of Registration.

I endeavored to have eliminated from these proposed statutes any parts that would prevent future recognition of licenses granted by one Board among the several others, and in some was able to secure this insertion of provisions that would tend toward a central Board of Examiners.

Now, in general we find that the chief causes for lack of success may be summoned up under the following heads:

First. Lack of thorough organization of the profession in the several states.

Second. Indifference of those most interested in the securing of such safeguards.

Third. Lack of public education of the scope and importance of veterinary medicine.

Fourth. Want of a central directing force to give impetus and support to these movements.

Now, permit me to say a few words about these several chief causes, that we may better understand the conditions and consider the remedies required.

First, there are in almost every state, from four to ten non-graduates or self-made practitioners, to every graduate. The former are more potential in defeating legislation than the latter are in securing it—first, because they have been as

a rule, longer residents of the state, and look with suspicion upon every movement that seems to be directed by college graduates.

Now, as I am firmly convinced that no legislation can be secured in any state that will rob these men of their means of a livelihood, for such legislation is contrary to the "Bill of Rights" of our land. I think it would be well for the profession in every state before the final drafting of proposed legislation, to call together a few of the best non-graduates and submit to them the plan of action, and thus disarm, in a great measure, the hostility of these men, that is oft-times the outcome of ignorance and misconception of the purposes and aims of such legislation.

I am opposed to all legislation that has for its aims the registration only of practitioners by any county officers throughout the state, whose source of remuneration is oft-times by fees only, and thus an incentive to register large numbers presents itself, and little consideration is given to the spirit and purpose of such laws. I am only favorable to legislation that will place registration in the hands of a Board of Examiners; therefore, in efforts to secure this recognition, there must be a more conservative spirit among all legitimate practitioners of veterinary science and before efforts are put forth, a more thorough organization of the entire profession.

We have found in some states many graduates arrayed against proposed legislation, because in some unimportant feature it failed to meet their own views, and these narrow, selfish fellows raising themselves against the broader interests to be conserved, have sacrificed the chances of successful legislation.

In most instances, we have found these same members of the profession, unwilling and indifferent enough to deny those who were planning these measures, their views and assistance in conference as to the best constituted safeguards to be secured by such legislation.

Perhaps of all the professions giving much to the common welfare of the whole people, there is not one that has so completely forgotten the need of educating the public of the

broad work done by our members in the interest of public health and safety. They for hundreds of years, abroad and at home, have given their protective influences to work that conserved public health in a great degree, and, in so doing, has laid no responsibility upon the public in return, forgetful of his first duty, in a measure, to their fellowman, that all safeguards, privileges and pleasures lay on the individual added responsibilities, and these must be discharged by better recognition and concessions to the source giving power from which they result. Our members have gone on and are still pursuing the same lines; increasing their zeal and interest in broader sanitary safeguards, in conserving the vested moneyed interests of a large proportion of our people, taxing his whole mind and physical powers in the field, the laboratory, the public highway, the farm, the breeding establishment, the public shops and common household, to better protect the whole people in the field of preventive medicine, utterly forgetful of his higher duty of teaching the individual his responsibility, and having him at his side at all times in aiding such measure of public import that contribute to the easier attainment of these ends, and thus save to the community, the value for years, of the more mature mind of the brain worker, whose years of labor at best are short, when spent in such a field of uncertainty as medicine has proven for centuries. I wish it were possible for me, through your important organization, to speak to every veterinarian of our land, of the great importance of educating public opinion and how hard must be the labor of a few of our profession in every community in gaining legislation, that should be conceded to us by a common impulse of our people, were they properly educated to a true conception of our work. How best this organization can remedy this wide spread defect of our education, I leave to the more mature consideration of many of our members, whose painful experiences and unceasing efforts are too well known to many of us to need further comment from me.

The want of a central directing power is much felt in all such efforts, and I know of no one line of work where this organization could be so great a force as in accepting in full,

the responsibility of the whole work of legislation. Nation nor state in any fitting measure, has given to your efforts in years gone by, worthy recognition of the great interests you have protected. Name me the school in the whole of North America, that has ever fittingly compensated a single promoter or teacher? Name me a state, county, city or town that has not received through your efforts in educating men for the profession, a greater return in better protected invested monetary interests, (not to speak of their work in protecting public health) than you have received in return. Your schools are without proper financial support; without national or state recognition; the public ignorant of their importance leave their wealth to pass into other channels to be worse than wasted while your labors and difficulties become more perplexing and unremunerative. I am optimistic enough to believe that this need not be so for any great period longer, could this organization become a great central educational bureau with its corps of assistants all over the country. A university extension system of work could be directed and the public press be made to serve as a common carrier of such useful information as would best attain our ends, and not in these years of advanced education have copied in some paper in every state in the union, the apparently curious information, that there existed in one large city of our land, a hospital for the treatment of domesticated animals.

The question of food inspection alone is one that the average reader is more ignorant of than any other problem half as important to his own personal welfare; yet, in the great work to be done how little has been accomplished. Here and there in our great commonwealths may be found a few towns, where meat and milk inspectors are regularly maintained, and in every instance, this has resulted from individual efforts through the lay press, which could have been extended by direction through a central bureau to hundreds of points, where there are to-day but single ones.

I hear some one say: Why if we went to the legislative halls and asked for legislation to protect legitimate practitioners and to prevent future entries into this profession

save those who had received a proper college education, that we had an ax to grind, a selfish motive in view. Yes, and any director or promotor of a college who could not answer this question with such force and clearness as to shame the one who presented it, and win for his cause a large measure of support, is not worthy of the place and power vested in him in such a position. Think for a moment what the Bureau of Animal Industry alone has done for vested money interests of our land, and show me as ill-paid a body of educated able men, the world over. These men have come from your colleges, and are you not worthy of some consideration, some support, some recognition, or some evidence of appreciation of your work?

Now, such a bureau could well direct on what lines such legislation should be formed; could well suggest the best means of securing the assistance of the daily press, and furnish to them suggested features of the public aspect of needed legislation as to interest the public reader, and thus make easier, the attainment of these measures and keep more uniform, the character of such legislation and thus serve the true interests of higher education and add to the measure of pleasure, happiness and contentment of the greatest nation of people in the world's history.

PROCEEDINGS

OF THE

FIRST ANNUAL MEETING

OF THE

United States Experiment Station

Veterinary Association,

HELD AT

NASHVILLE, TENNESSEE,

SEPTEMBER, 1897.

**OFFICERS *Pro Tem*.**

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**PRESIDENT,**

**DR. C. A. CARY, ALABAMA.**

**SECRETARY,**

**DR. A. T. PETERS, NEBRASKA.**

**COMMITTEE ON CONSTITUTION AND BY-LAWS,**

**DR. C. A. CARY, ALABAMA,**

**DR. M. H. REYNOLDS, MINNESOTA.**

**DR. A. T. PETERS, NEBRASKA.**

## MINUTES OF THE PROCEEDINGS.

TULANE HOTEL, NASHVILLE, TENN., 8 P. M., September 7, 1897.

The United States Experiment Station Association was called to order by the President, Dr. C. A. Cary.

The roll call showed the following gentlemen to be present: Drs. C. A. Cary, D. E. Salmon, A. W. Bitting, M. Stalker, W. B. Niles, W. H. Dalrymple, J. C. Robert, J. W. Connoway, A. T. Peters, James Law, T. D. Hinebauch, M. Francis, E. P. Niles, F. S. Roop, and S. B. Nelson.

The minutes of the previous meeting were read and approved. The report of the secretary was approved as read. The report of the Committee on Constitution and By-Laws was adopted with but few changes.

The election of officers resulted in the selection of Dr. C. A. Cary, President; Dr. A. W. Bitting, Vice-President; and Dr. A. T. Peters, Secretary-Treasurer. Dr. J. W. Connoway, Dr. James Law, and Dr. S. B. Nelson, members of the Executive Committee.

Meeting then adjourned till September 9th, when the following papers were presented:

The Work of the Station Veterinarian, Dr. N. S. Mayo, Kansas.

On account of Dr. Mayo's absence the title of the paper only was read.

Effects of Cannabis Indica, Dr. T. D. Hinebauch, North Dakota.

This paper was also read by title, the author not being present.

Some Experiments with the Spirmophiles of Washington, Dr. S. B. Nelson, Washington.

Discussion was taken part in by Drs. Connoway, Francis, Robert, Cary, and Hinebauch. The tenor of the discussion



was as to whether or not it would be practical to use the diphtheria bacillus or the gonococcus in the eradication of these pests. To which Dr. Nelson replied that he contemplated experimenting with these two germs; also with the virus prepared by the Pasteur Institute, and a virus which he had found disastrous in certain localities to squirrels.

Some of the effects of Cotton Seed and Cotton Seed Meal on Hogs, when Fed as a Mixed or Single Ration, Dr. C. A. Cary, Alabama.

This was given in the form of a talk, and discussed freely by Drs. Francis, Law, Robert, Peters, and Connoway. Dr. Cary hopes to have further data on the effects of this ration in the near future, especially along the line of how best it can be utilized as a food for hogs. He was of the opinion that if prepared in a certain way it is not injurious to the hog, and would give a very cheap food to stockmen in the South. Opinions varied greatly as to how the material should be fed. A little more observation along this line will be of interest.

Report of Experiments on the Prevention of Texas Fever, Dr. J. W. Connoway, Missouri.

This paper was read and discussed before the U. S. V. M. A.

On motion the place of meeting next year was left to the Executive Committee. The meeting then adjourned.

## THE WORK OF THE STATION VETERINARIAN.

BY DR. NELSON S. MAYO.

The work of the Station Veterinarian must, of necessity, vary greatly, according to his qualifications, tastes, equipment, financial support, and the circumstances and conditions which surround the Experiment Station where he may be located.

As most of the Experiment Stations are associated with Agricultural Colleges, and the financial support so limited, it will be assumed that the average Experiment Station Veterinarian is also veterinarian to the college, and as such, will do more or less teaching in class-room or laboratory. The teaching required of the veterinarian should be along lines most closely related to his professional work and should not demand too much time or energy. That a Station Veterinarian should be expected to teach Veterinary Science, human and comparative anatomy and physiology, zoology, geology, act as curator of the general college museum and director of athletics, is expecting altogether too much, as the author is willing to testify. I am not prepared to defend the plan of having the veterinarian do other work than that not properly belonging to the Experiment Station. An investigator of animal diseases, and I hold that to be the realm of the Experiment Station Veterinarian, to do the most and best work, should devote his whole time and energy to this work and not be hampered with class-room work with its distractions and responsibilities.

On the other hand, under the present conditions of Experiment Stations in this country, there are some excellent reasons why the Station Veterinarians should be veterinarian to the College. Experiment Stations to do the best

work should have the support of the farmers and stock men of the state. The connection of the Station with the College is usually a good way of advertising the Station and gaining the required support of the people.

The Veterinary Department of the Experiment Station should be one of the leading departments of the Station, at least in states where the live stock interests are important. Farmers are quick to recognize the practical side of veterinary work and are generous in its support.

Theoretically the work of the Experiment Station Veterinarian should be original work, but practically I fear he falls far short of the desired goal. The American people are anxious for results; they do not realize the time and labor necessary to gain satisfactory results in the original investigation of animal diseases. Could such men as Professors Koch, Bang, or Louis Pasteur, work for years in an American Experiment Station with large expenditure of public funds, and not give to the public results, especially in a Western state? The probabilities are that such men would be deemed "too conservative," dubbed "fossils," and they would be succeeded by "hustlers from the West," who could dish out results in frequent bulletins an inch in thickness, redolent with scientific names that the readers do not understand, and positive conclusions that facts do not support.

There are two features of Experiment Station work that must be met that the work may be successful and of value to the people for whom the Experiment Stations were established. The work must be thoroughly scientific, and it should be as practical as possible and placed clearly and plainly before the people.

In planning experimental work, the veterinarian should, so far as is possible, select subjects which are of most importance to the stockmen of his state, and which offer the best chances of successful solution. I do not believe that the average Station Veterinarian should plunge into and devote his time and energy to the investigation of diseases upon which the ablest investigators of the world have labored for years. The probabilities are that his work for several years will be a threshing of old straw, and remarka-

ble discoveries will be absent, or purely accidental. I do not mean to imply that such diseases should be neglected.

Observations, statistics and full notes should be collected and preserved of every outbreak of disease and isolated cases that come under his notice. The collection and preservation of notes by Station Veterinarians of observations and investigations, whether successful or not, is a very important part of Experiment Station work, and one that is often neglected.

As a general rule I think those diseases that are little known and especially those animal diseases confined to certain states or localities, usually offer the best opportunities for original work, and promise the greater success. Bulletins upon sporadic diseases, such as lameness or colic, unless they contain original work, are of little value. Such information as they contain are readily available to stockmen in numerous works upon veterinary subjects. I do not mean to imply that bulletins should contain only original work, *but all bulletins should contain some original work and the more original work the better.*

In the preparation of a bulletin a synopsis or compilation from the works of others should be given and due credit rendered. The work of the author should be clearly stated in language as devoid of technical terms as possible. Conclusions should be drawn and the evidence to support them given in detail. Illustrations are valuable if they mean anything, but illustrations of technical subjects "for art's sake," or simply for "pictures," are useless, I believe. In the arrangement of the bulletin the illustrations should be placed in as close proximity as possible to the text relating to the illustration. It is annoying to find valuable illustrations in a bunch at the back of a bulletin or book where the reader has to look at the illustrations with one hand and study the text with the other.

Another important feature of Experiment Station work which is often neglected, is a careful planning of proposed work in detail. I know radical changes are sometimes made apparent as the work progresses, but this only emphasizes the importance of a definite plan. A great waste of time and

results in original research often follows when not guided by a well formed plan. The plan of work should be submitted to the Director of the Station, or the Station Council for suggestions and approval, together with an estimate of the probable cost of the work. Valuable suggestions are often gathered from most unexpected sources.

In spite of the uncertainties and other disagreeable features of Experiment Station work, there is one phase not often considered. The pleasure and satisfaction that comes from original research. To be a worker, a pioneer, however humble, breaking the way into the great unknown, wresting from nature her secrets, denied to others. These are rewards that are real, and it is to be hoped that a grateful people may reward you, as they occasionally do, after you are dead and gone.

## CANNABIS INDICA,

BY DR. T. D. HINEBAUCH AND CHAS. WARNER.

Nat. Ord. Urticaceae. Sub. Ord. Cannabineae.

Indian hemp, the dried flowers or fruiting tops of the female plants of *Cannabis Sativa*, grown in India, and from which resin has been removed, known there as Gunjah or Ganga, and as Hashhish, in Arabia.

The *Cannabis Sativa* is a native of India and is cultivated in the southern states of America. The most observing botanists on comparing the two have been unable to discern any specific difference between them. The American and true Indian hemp are respectively described in the U. S. P. as follows: "Stems about six feet high, rough leaves, opposite below, alternate above, petiolate, digitate the leaflets linear-lanceolate, serrate, dioecious, the staminate flowers in pedunculate clusters, forming compound racemes, the pistillate flowers, axillary, sessile and bractate, odor heavy, taste bitter, slightly acrid. Branching, compressed, brittle, about two inches long, with a few digitate leaves having linear-lanceolate leaflets and numerous sheathing pointed bracts, each containing two small pistillate flowers, sometimes with the nearly ripe fruit, the whole more or less agglutinated with a resinous exudation. It has a brownish color, a peculiar narcotic odor and a slightly acrid taste. Hemp is an annual plant, the male differing from the female in having five parted calyx and five stamens."

The imported medicinal resin or extract of hemp directed by the U. S. P. of 1860, is made by evaporating the dried tops. Dr. O. Shaughnessy directs it to be prepared by boiling the tops of the gunjah in alcohol until all the resin is dissolved, then evaporating to dryness on a water bath. Fresh

hemp has a peculiar narcotic odor which will produce headache and a species of intoxication. It is blackish green, has a warm bitterish and acrid taste. The fluid extract is prepared by dissolving an ounce of the extract in a pint of alcohol.

Medically it is a powerful narcotic, causing exhilaration, intoxication, drowsiness, and stupor. It does not check secretions, constipate or stop peristaltic action of the bowels. The appetite is diminished or totally lost when an animal is under its influence, but afterwards is strengthened. Indian hemp is a narcotic, anodyne, anti-spasmodic and refrigerant.

Sir Robert Christison stated that "for energy, certainty and convenience, Indian hemp is the next anodyne to opium and often equals it."

Mr. Richard Rutherford, of Edinburgh, used Indian hemp for several years in India in the treatment of colic in horses and cattle, and he states that it relieves spasm and pain as quickly as opium, but more permanently, and without arresting the action of the bowels or leaving headache or delirium as opium occasionally does.

It is prescribed in tetanus, hysteria, convulsion, colic and uterine irritation.

The following experiments were made by the writer using Parke, Davis & Co.'s fluid extract of *Cannabis Indica*. The subject was a healthy horse in good condition, which had been turned out during the winter. The feed consisted of one quart of oats three times a day, besides hay and water.

May 13th, 1897, at 6 P. M., temperature 99.6, pulse 40, respirations 9.

May 14th, 6 A. M., temperature 99.8, pulse 40, respirations 9, animal to all appearances in normal condition. At 6:30 administered 2 fl. oz. Fluid Extract *Cannabis Indica* by mouth.

At 6:30 A. M., horse uneasy and gapping, indifferent as to eating, slight colicky pains, throws head with an occasional eruption and gurgling in the throat. At 7 o'clock very uneasy and anxious, but still nibbling hay. Kicking and pointing nose toward abdomen, went down at 8 in pain, lies stretched out and quiet, with an occasional start; temper-

ature 100, pulse 60, respiration 8. Animal got up at 7:35 showing slight colicky pains, gapping. At 7:40 animal stands quiet with eyes partly closed, temperature 99, pulse 44, respirations (rather heavy) 8 per minute, and to all appearances asleep. Animal takes no notice of objects moving around him. Eruptions with gurgling in throat, swallowing occasionally, jumps or starts in sleep. At 8 A. M. uneasy, shows symptoms of colic, but is asleep again at 8:05, temperature 99, pulse 45, respirations 8, animal sways from side to side, nearly falling at times, catching himself with a grunt.

At 8:30 somewhat uneasy, stretches and points nose to abdomen. At 8:35 apparently quiet and asleep, temperature 98, pulse 36, respirations 8.

At 8:30 begins nibbling hay, but rejects it after chewing it a few times, gaps two or three times per minute, and seems to be in more pain than at any previous time. Went down at 9 A. M., respirations 12 and labored, raises head frequently, gets up at 9:15 and is asleep in two minutes, awakes at 9:30 and goes to eating hay, seems to be in normal condition with the exception of an occasional eruption, temperature 97.2, pulse 36, respirations 8.

At 9:40 animal is taken with another paroxysm of pain with all the symptoms of colic, lies down at 9:45, but is up in two minutes, apparently free from pain, after a considerable amount of flatus has passed. At 10:00 he was taken with colicky pains, same symptoms repeated as at 9:40, lasting about three minutes. At 10:30 he went to sleep and would nearly fall at times, temperature 97.2, pulse 36, respirations 8. At 11:00 still sleeping, with an occasional grunt as he catches himself falling. Temperature 97.6, pulse 36, respirations 8. At 11:30 no change.

At 12 offered water, but would not drink; gave one quart of oats, after eating which he fell asleep, and at times would fall against the stable partition. Temperature 97.6, pulse 36, respirations 8. At 1:00 P. M. no change. At 1:30 no change in condition except awake and eating hay. At 2:30 no change. At 3:00 went to sleep, swaying from side to side; continues asleep until 4:00, temperature 97.2, pulse 35,



respirations 8. Began eating hay, but in five minutes showed signs of colic, then went to sleep, nearly falling at times. At 4:30 animal was taken with very severe colicky pains, which lasted till 5:00, temperature 97.2, pulse 35, respirations 8. Animal has been shivering slightly since 12:00 o'clock, and is now, at 5:00 o'clock, shaking violently, pointing nose toward breast and biting shoulders, lifting the hind leg and kicking abdomen; blanketed at 5:00. At 6:00 horse still shivering and in pain, dozing at intervals, temperature 98, pulse 36, respirations 8; was offered water and grain but would touch neither. At 7:00 sleeping, seems to be free from pain, temperature 98.4, pulse 36, respirations 9. At 8:00 had eaten oats, but still dozes occasionally, temperature 98.6, pulse 36, respirations 9; was offered water but would not drink, has not tasted water since the administrations of the drug. Shivering has ceased. At 9:00 animal seems to be in normal condition with the exception of being sleepy, temperature 99.4, pulse 40, respirations 9. At 10:00 no change in condition, temperature 99.8, pulse 40, respirations 9.

At 6:00 A. M. the next day when led out to water he seemed to be very weak, was uncertain in his gait; he would not drink, but ate his oats and hay, temperature 100, pulse 45, respirations 9. At 9 o'clock he seemed to be in normal condition and was turned out to pasture.

June 1st the same horse was taken from the pasture, temperature 99.8, pulse 40, respirations 8. June 2nd, at 6 A. M., temperature 100, pulse 40, respirations 8, administered 5 oz. of fluid extract of *Cannabis Indica*.

The symptoms were taken hourly but did not differ much from those of the other experiment, except that there was little pain shown, and the stupor was intense and continued. At one time the horse fell to his knees, but continued sleeping for a few minutes with his nose on the ground, and his head resting against the manger. He could be awakened at any time with a slap or two, but seemed all the time to be in a dazed condition. His temperature went down in one hour to 97.2, the lowest being 96.8, and did not regain its normal condition until the third morning. He was then turned out

to pasture, being no weaker after this trial than after the other, but he stood in the field all day while the other horses were eating grass, and would touch but little himself. The next day he seemed to be perfectly well and acted naturally.

June 30th he was taken from the pasture again, and on July 1st was given ounce doses, after taking his temperature twice, which was June 30th, temperature 99.6, pulse 40, respiration 9. July 1st, temperature 99.8, pulse 40, respiration 9.

July 1st, at 7 A. M., administered one drachm. The experiment was tried on another horse at the same time. The horse which underwent the previous experiments, I will designate as No. 1, the other horse as No. 2. June 30th, temperature 99.6, pulse 40. July 1st, horse No. 1, temperature 99.8, pulse 40.

June 30th, horse No. 2, temperature 100, pulse 40.

July 1st, horse No. 2, temperature 100.5, pulse 40.

Both horses were given on July 1st at 1 o'clock A. M., one drachm of Ex. Cannabis Indica. At 8 they were becoming drowsy. Their temperature had not changed. Another drachm was given, and at 8:15, the horse No. 1 was asleep. At 8:30 No. 2 slept; temperature of both normal. At 9 o'clock both horses were alternately dozing and nibbling hay; temperature normal. No pain. Gave another drachm. At 9:30 both horses were sleeping. No. 1, temperature 98.4, pulse 40. No. 2, temperature 99, pulse 40.

At 10:00 No. 1, temperature 98.4, pulse 40. No. 2, temperature 99, pulse 40. Administered one drachm. At 10:30 No. 1 in pain, but asleep most of the time, temperature 97.6, pulse 36. No. 2 uneasy, asleep most of the time, temperature 98.2. At 11:00 No. 1 horse asleep, temperature 97.6, gave one drachm. No. 2 asleep, temperature 98. Discontinued the drug on No. 2. At 12 both horses were asleep, No. 1 temperature 97.6, No. 2 temperature 98.4. Discontinued the drug on No. 1. At 1 o'clock both horses dozing. No. 1 temperature 97.6, No. 2 temperature 99. At 2:00 both horses asleep, No. 1 temperature 97.6, No. 2 temperature 99. At 3:00 No. 1 is asleep most of the time, temperature 97.6. No. 2 sleeps but little and is stupid, temperature 99.8. At

4:00 No. 1 is still dozing, temperature 98.8. No. 2 stands quiet and nibbles hay occasionally, temperature 101. At 5:00 No. 1 dozing off, and temperature 99.5. No. 2 awake, but rather stupid, temperature 100.5. At 6:00, No. 1, no change, temperature 99.6. No. 2, no change, temperature 100.5.

SOME POISON EXPERIMENTS WITH  
SPERMOPHILES,

BY DR. S. B. NELSON.

In the state of Washington there exists a small rodent, generally known as the ground squirrel. It is a spermophile. In the eastern part of the state are two species, *Spermophilus Columbianus* and *S. Townsendii*. In the central part of the state is found the *S. Mollus*.

This noxious pest destroys, annually, for the farmers, thousands upon thousands of dollars worth of grain. The question of overcoming this great loss has become a very important one.

The means employed for the destruction of these animals have been poisons of various kinds, forcing gases into the burrows and closing the opening, inoculations with infectious diseases, trapping and shooting.

To determine the value of the different methods of fighting the squirrels a number of experiments have been conducted by the biologist of the Station, and myself. These covered poisoning, gases and infectious diseases. We shall this time deal with the poison experiments and leave the discussion of the others for some future time. Before going into these in detail it may be well to give a short verbal description of the spermophile and note some of its habits.

For a detailed description of these different spermophiles I refer you to Lewis and Clark Expedition, Paul Allen Edition, 1814, 2 pp. 173-174 for the *Spermophilus Columbianus*. For *Spermophilus Townsendii*, Bachman, Journal Academy Natural Sciences, Philadelphia, Vol. 3, 1839, pp. 61-62, and for *Spermophilus Mollis*, Kennicott, Proceedings Academy Natural Sciences, Philadelphia, 1863, pp. 158.

The habits of the largest one, *S. Columbianus*, has been observed more closely by us, than those of either of the

smaller species, therefore we will describe his habits and when possible show the differences of the others.

*S. Columbiana* make their appearance in February, sometimes as early as the latter part of January. As to condition they may be either fat or lean, which probably depends on their condition when they hibernated. It sometimes happens that the ground is covered with snow or a heavy snowfall occurs after they have come out. Whether this affects them or not we do not know. They commence to hibernate in the latter part of July and this period extends into August, until about the middle of the month, when they have all disappeared, with the exception of a few stragglers that are out until the last of August. From this time until February, six months, they hibernate, not showing themselves again before the next spring. When they are in their burrows, during the state of hibernation, the temperature has apparently no effect on them, as they sleep during the three hot months of August, September and October, appearing again in the cold months of January, February and March. In the laboratory, however, they will curl up and become rigid during a cold spell in Autumn, but with a few warm days, or even when they are placed near a heated radiator for some time, revive again, showing that under unnatural conditions they react to a marked variation in temperature.

In April they give birth to their young. In the laboratory one young was born April eleventh, another litter of five was born April twenty-first. The number of young vary from one to six, we found most often either four or five.

Many thousand squirrels die yearly, yet the number of carcasses found scattered over the ground is comparatively few. What becomes of them? Are the squirrels cannibalistic? Do they bury their dead? We are not able to answer this conclusively. In the laboratory they are cannibalistic. They will leave green food to eat a carcass. In the field we have on two occasions observed a squirrel eating the carcass of another.

The poisons used in our experiments were strychnia, mercuric chloride, phosphorous, and phosphoric acid.

Many farmers who have used and are using strychnia, believe that unless the mixture is made strong enough to kill immediately, by eating only one poisoned seed of the material, that as soon as the squirrel detects the bitter taste of strychnia, he will cease eating the poison. In addition to this to observe the amount of poison necessary to kill, the following experiments with strychnia were tried. The mixture used was prepared as follows: four grms. strychnia was boiled in one liter of water until the strychnia was dissolved, then added enough sugar to make it syrupy, poured in oats enough to absorb the solution; boiled one hour, cooled and dried it.

EXPERIMENT 1. Gave to one squirrel one seed of the prepared oats. No effect.

EXPERIMENT 2. This was rather a voluntary experiment on the part of the squirrel. He was running about the laboratory, having escaped from his cage, and obtained some of the prepared oats while I was out of the laboratory twenty minutes. When I returned he was in spasms and died five minutes later. On post mortem obtained contents of stomach. The oat material in the stomach weighed about three hundred mgrms. equal to about the weight of six oat grains.

EXPERIMENT 3. Fed at 1:55 P. M. three seeds each as follows: (natural), (strychnined), (sugared). The natural were just oats, and the sugared ones had been covered with syrup and allowed to dry. At 2:15 the sugared ones are all gone, two of the natural ones, none of the strychnined. At 2:25 all are eaten except one of the natural. 5:30 no effect. Next day at 2:00 P. M. no result.

EXPERIMENT 4. Gave at 1:40 P. M. as follows: five seeds each, with the exception of strychnined oats, which was four seeds, (natural), (sugared), (strychnined), (natural), (sugared). At 3:20 he had eaten nearly all of the oats, but he was so wild that in running around in the cage, he had mixed the dishes to such an extent that it could not be told which oats he had eaten first. 4:00, no effect. 6:00, no effect. Next day 11:00 A. M., no effect.

EXPERIMENT 5. At 1:58 P. M. gave to *S. Columbiana* arranged as follows: five, (natural,) five, (sugared,) four, (sugared,) four, (strychnined,) five, (natural,) five, (sugared,) five. (natural,) seeds. At 3:25 nearly all eaten. Unable to tell which were eaten first. 6:00, no result. Next day at 11:00, no effect.

EXPERIMENT 6. Gave to same squirrel as in Experiment No. 4, five seeds of strychnined oats. At 1:15 he was dead. Oats had been eaten.

EXPERIMENT 7. At the same time as the last experiment gave to the same squirrel that was used in No. 5, six seeds of strychnined oats. At 1:15 the oats are not touched. 3:20 the squirrel is nearly dead, but the oats have not been touched. The following day he is dead, the oats not eaten.

EXPERIMENT 8. At 4:00 P. M. gave five seeds of strychnined oats to one *S. Columbiana*. Fed him the same as the others. The following day the oats are all eaten. Second day—the squirrel died during the night.

EXPERIMENT 9. Gave at noon four seeds of strychnined oats to one *S. Columbiana*. 11:00 A. M. next day he was dead.

EXPERIMENT 10. Gave to squirrel four seeds of strychnined oats. Next day he is sick. Second day the same. Third day nearly dead. Fourth, dead.

EXPERIMENT 11. Fed squirrel six seeds of the strychnined oats. Two days later nearly dead. Died the following night.

TABULATING. In experiments one and three the results are negative. In number four, giving four seeds of the poisoned grain, the result is negative, but with the combination of number six, giving an additional five seeds, the results are fatal in two and one-half hours. In experiments five and ten, four seeds kill in thirty-six and eighty hours respectively. In numbers eight and nine, five seeds of the poisoned grain prove fatal in thirty-six and twenty-four hours, while in experiment eleven, six seeds caused death in sixty hours. The variation in the action of the poison is very likely due to the difference in size and hardness of each particular squirrel. Those that received four seeds or over died, but those that received a less number remained well. These experiments

also show that squirrels will continue to eat the poisoned grain after they have detected the bitter taste of strychnia.

Strychnia is quite expensive for this purpose, costing the consumer not less than one dollar per ounce. We therefore sought for a substitute that would be cheaper, for instance, corrosive sublimate.

The oats were prepared as follows: corrosive sublimate four grms., water five hundred c. c. Oats to make nearly one liter. Soaked the oats eighteen hours, dried and coated with syrup.

EXPERIMENT 1. Gave to four squirrels twenty seeds of the prepared oats. No result.

EXPERIMENT 2. Gave to one squirrel three seeds of the prepared oats. Next day had not eaten oats.

EXPERIMENT 3. Fed one squirrel twenty-five seeds of the oats. Next day the oats are eaten. Died on the fifth day.

EXPERIMENT 4. Gave to four squirrels thirty grains of the prepared oats; by the next day the oats are eaten. On the fifth day two of the squirrels died. The other two remained well.

EXPERIMENT 5. Fed one squirrel two seeds of poisoned oats, that had been sugared, one poisoned seed not sugared, and two seed poisoned with strychnia. Squirrel died thirty hours later.

EXPERIMENT 6. Gave to *S. Townsendii* six seeds of the prepared oats. The oats were eaten during the night. In the morning he is sick. Died at 1:30 P. M.

EXPERIMENT 7. Fed *S. Columbiana* twenty-five seeds of the oats. He ate them during the night. No effect; he remained well.

TABULATING. Experiments one and two give negative results. In number three the squirrel dies in five days, while in number four two die and two remain well. In experiment five where a combination of strychnia and corrosive sublimate is used, death occurs in thirty hours. In number six the small squirrel is used and six seeds prove fatal in twenty-four hours. In the last experiment, number seven, twenty-five grains give no result with *S. Columbiana*. In this case the seeds used are seven days old. Taking the experiments



all together they do not give very satisfactory results for corrosive sublimate.

Chemists tell us that phosphorous is not soluble in water, yet the layman takes phosphorus, puts it into water, boils it, adding the grain to be used, and thus prepares another poisonous mixture.

Does a chemical action take place here so as to form a soluble poison? Or is the phosphorous simply broken up into minute particles and adhere to the grain? Let us see. The gas given off when the phosphorous is boiled in water is phosphorous pentoxide, which in combination with water forms phosphoric acid, and in this case is in solution. Now it remains to be seen if phosphoric acid is poisonous. The following experiments were carried out for this purpose. The poisons were mixed by the Assistant Chemist of this Station.

POISON No. 1. Phosphoric acid, saturated solution, oats, flour and sugar to make a dough. Fed one teaspoonful of this mixture to two squirrels, separately. No effect on one of them; the other one died four days later.

POISON No. 2. Phosphorous  $11\frac{1}{2}$  grms., oats 10 grms., sugar 5 grms., flour 5 grms. Fed one teaspoonful of this preparation to each of two squirrels. They did not eat all of it. Both of them died the following day.

POISON No. 3. Phosphorous, oats and sugar. Fed one teaspoonful to each of two squirrels. Did not eat it very well. One died in thirty-six hours, the other one on the sixth day.

POISON No. 4. Phosphorous 3 grms., oats 20 grms., sugar 10 grms., flour 10 grms. One teaspoonful was given to each of three squirrels. One of them died the same afternoon. The other two were dead the following morning.

POISON No. 5. Phosphoric acid thirty per cent. solution. Fed one squirrel one c. c. of this solution. Had no effect.

POISON No. 6. Phosphorous 5 grms., corn meal 120 grms., flour 60 grms., sugar 30 grms. Fed one teaspoonful to one squirrel. Found him dead the next morning.

TABULATING. Phosphorous killed all the squirrels, with one exception, within thirty-six hours.

Phosphoric acid in mixture killed one squirrel in four days, while with the other a negative result was obtained.

The phosphoric acid in solution gave a negative result.

We believe that these experiments show that the phosphorous simply attaches itself in minute particles to the seeds, or is mixed in that manner in the flour when such is used.

In the early part of this paper I made the statement that we did not wish to touch the bacteriological side of this question, but there is just one thing that I would like to mention, and that is, the needles or syringes used for injection purposes. The common hypodermic syringe is a very unsatisfactory instrument to use for this purpose, as it is very hard to sterilize, and it either necessitates the making of only one injection at the time, then waiting for the syringe to be sterilized again, or to have a number of syringes, which means quite an expense. The leather pistons not being able to stand the continuous heating are most of the time out of order. The Koch syringe has the disadvantage of being complex, and unless great care is exercised, fluid is drawn into the bulb which is not sterile. The bulb also suffers from the numerous removals from the balance of the syringe.

Sternberg, in his Manual of Bacteriology, describes a syringe made out of glass. This is simply a glass cylinder blown into a bulb at one end and drawn into a fine point at the other. Heating the bulb expands the contained air, then the point is placed in the fluid, the air in the bulb contracts, and the fluid is sucked into the tube. Heating the bulb again after the point of the syringe has been inserted under the skin forces the contents of the syringe out. This does very well for thin skinned, or young, small animals, but in the spermophiles the skin is thick, and it is difficult to push the point of the syringe through the skin without often breaking the point. We have modified the point of the syringe so that it would fit snugly into the base of a hypodermic needle. In this case being separated into two parts. It is possible that this may be made of aluminum so as not to be so frail. Another modification of the same

syringe is to fuse the tube portion of a hypodermic needle into the point of the syringe. This makes a very cheap instrument, which can be easily inserted through the skin, even when the skin is quite thick. It is thoroughly sterilized by either dry or damp heat, and a comparatively large number can be made at the same time and be kept on hand in the laboratory.

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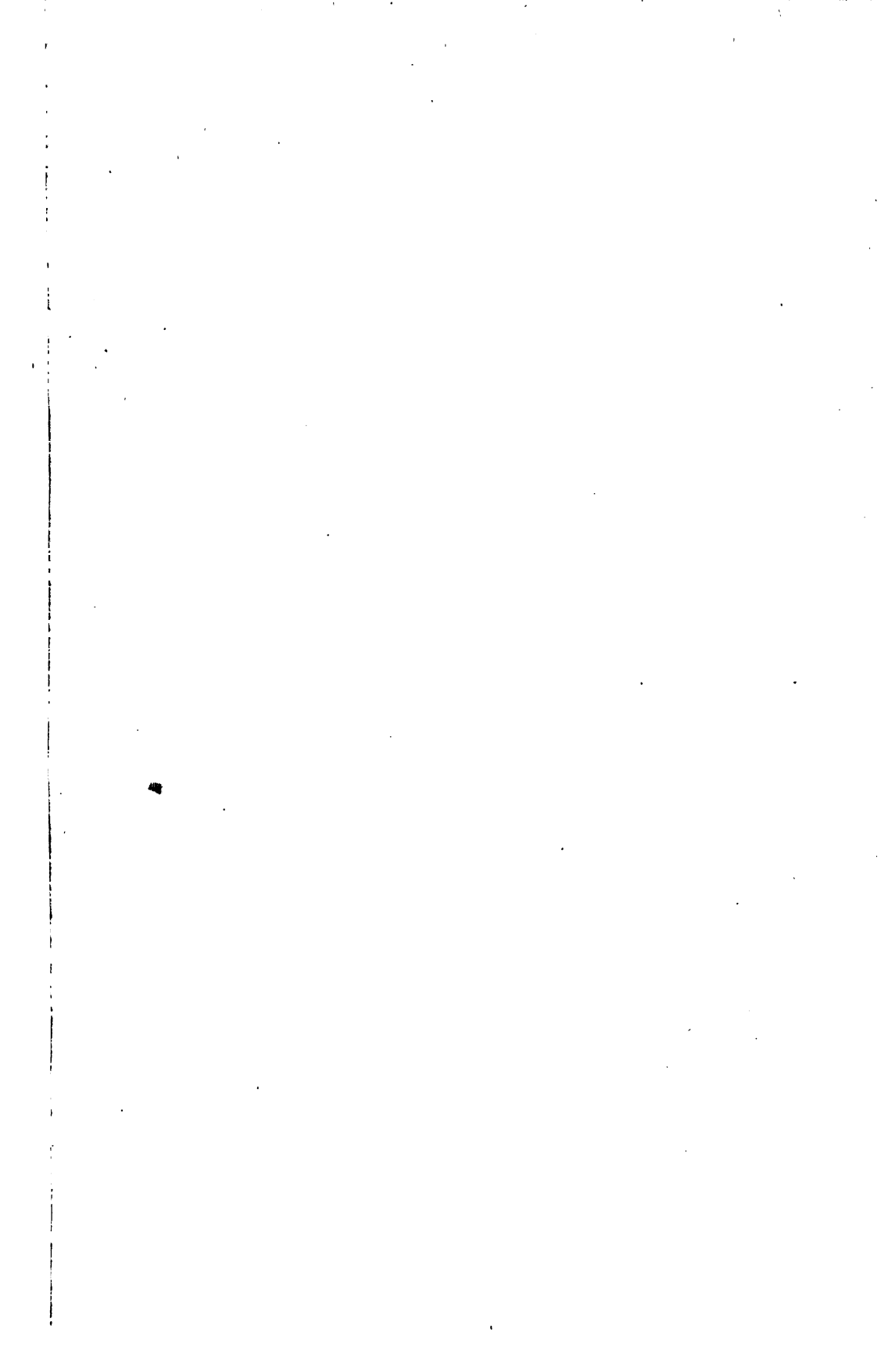


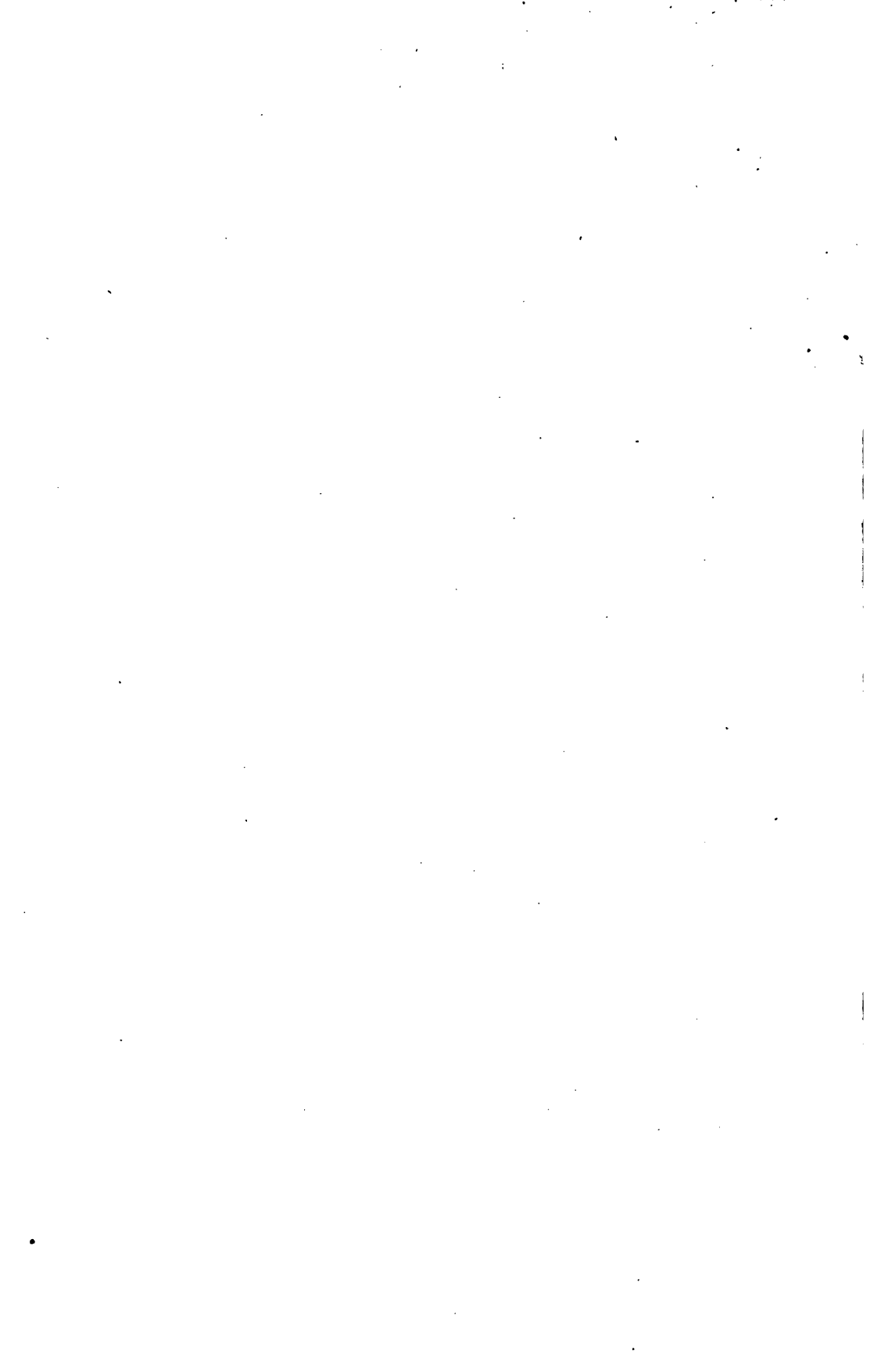
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